ZXAppeal

NEWSLETTER OF THE

JULY/AUGUST 1986 $ 1.50

VANCOUVER SINCLAIR USERS GROUP

******** NEXT MEETING ********

KILLARNY COMMUNITY CENTRE
6260 KILLARNY ST., VANC

SEPT. 12, 7:00PM

THIS WILL BE THE FIRST MEETING AFTER OUR SUMMER BREAK.

ZXAPPEAL IS A MONTHLY NEWSLETTER PUT OUT BY THE VANCOUVER SINCLAIR USERS GROUP. FOR MORE INFORMATION ON THE CLUB AND ZXAPPEAL SEE THE BACKCOVER.

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This Issue.....

Here we are - half way thru the summer and it's time for our summer double edition. This one is chock full of goodies: "The Decline of Uncle Clive" looks at Clive Sinclair in an unflattering but very candid light - must reading for any Sinclairphile; The Zeeper "graces" us again with his Presence; Ken A. gives us a nice example of 1000 programming; Gerd B. presents an article based on the Non Volitile Memory single chip internal add-on that Wilf R. recently engineered; I've included a program that allows one to set up a message BBS; all this and lots more too!

Bits & Pieces.....

...SUM magazine has been bought out by TIME DESIGNS. Sad to lose a great supporter of the Sinclair concept but hopefully TIME DESIGNS will, as a result of the merger, grow for the benefit of all. Remember, only our continued support of this and other publications will ensure their existence.
...who says the QL is dead. We've heard of 2, maybe 3, QL clones coming on the market in Gt. Britain. Remember Alan, the cream always rises to the top!
...take a good look at the advert for Byte Power. Sounds like a good deal. Remember, support our advertisers. Their paid ads subsidize your newsletter costs!
...take a look at the ad for Fred Nachbour's "Dungeon of Ymir". Fred colaborated on Gerd's article. This game is HI RES on a 1500!
...if anyone wants a good and CHEAP composite monitor hustle along to R&P Electronis at 4th & Arbutus. 14" B&W 'slightly' used -- $49.95 each or 3/$100.00. These are Hi Res and come from a stock brokerage.
...I had a chance to try out a couple of new additions to John B.'s list of wares. ARTWORX is 10 out of 10! A "must-have" for anyone with a 2068. We'll have a full review in an upcoming issue but let me say that this is the neatest, most friendly, & addictive graphics utility to come my way. I was up until 2:30 just having fun with it.
TIMACHINE is a complete MC compiler for all the 2068 Basic commands. Now that favourite BASIC program can be compiled into superfast machine code.
CLONE will make a back-up of ANY 2068 or Spectrum program.
...be sure to give CITY-LINK a call and tune into the HOTLINE sub-board hosted by our very own John B. A list of BBS numbers is listed in this issue.
...Peter Hacksel of Hacksel Electronics was in town recently and we got to gether so he could demo the Hacksel Centronics Printer Interface. This unit is comes in either rear edge or cartridge dock configuration. This is a very neat interface for the 2068 and if you are in the market for one BUY CANADIAN.
That's all for this time TTUL
.....Rod

The Meeting:

Came to order with only 15 bodies present. Everyone seemed to have something else come up that nite. Bob L. announced he was stepping down as the Prez. He's sold his whole systen and going over to the other side(Atari). That means that Ken A. moves up to Prez. Anywun wanna be V/Prez? Hold up yor hand! Wilf brought us up to date on how the hard ware group was coming with the bankswitch memory unit. They now have 5 prototypes up and running and hope to have the production model on the shelf by 1st Sept. 512k plus EPROM burner on the back of a 1000! Gerd B. spoke about the article he was submitting to the newsletter re: 8k NVM inside 1000. Ken A. showed his I.O. board and ZSpeak board combo in a case. Very slick. He uses it as a teaching aid at school for children learning "ingrish" as a second language. Harvey T. proadly demoed his "text to speech" board for the QL. VERY slick. Paul R. gave us some "propaganda" about his ST and the ST club. We ajourned for the summer and will meet on the 12th of September.

****

Here's an elegant 2k program by Ken Abramson that utilizes the speech board on the 1000.

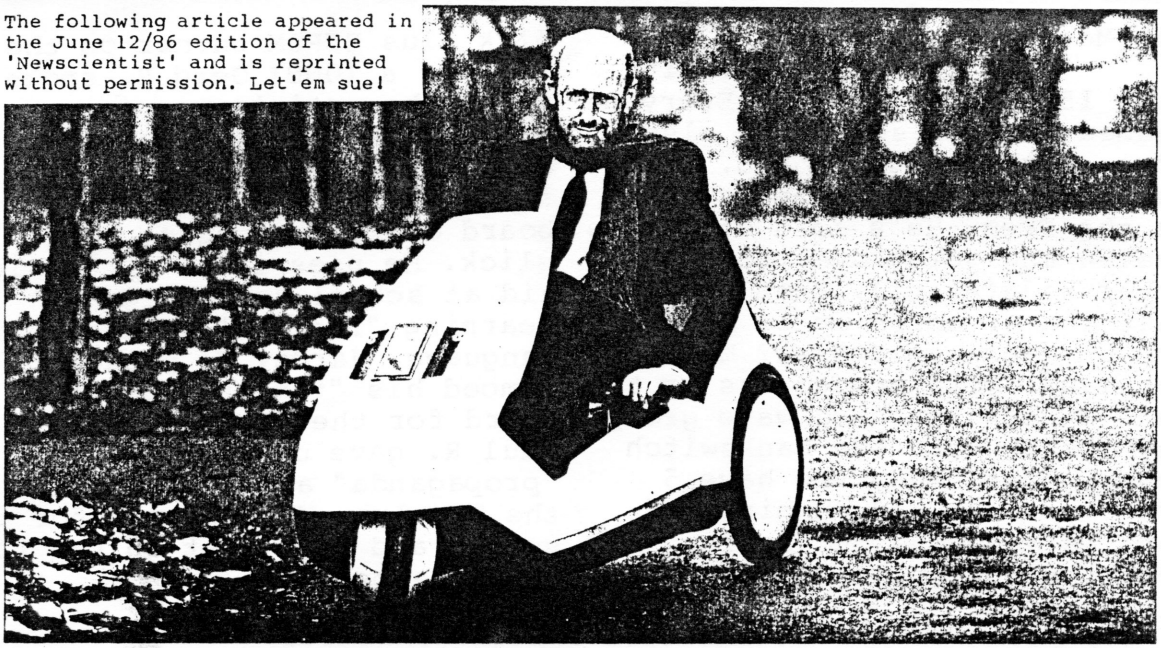
```
   0 REM   Y PEEK RY?PEEK BTAN Y
 PEEK *Y PEEK B<=BACS C IF / FO
R 890
   2 REM ZX81 ZSPEAK PROGRAM(2K)

   3 LET Z=200
   5 CLS
   6 PRINT TAB 6;"FUNCTION","COM
MAND",,,,,,,TAB 10;"MENU","GOTO
5",,,"NEW ALLOPHONES","GOTO 10",
,,"CONT, ENTERING","GOTO 30",,,T
AB 9;"SPEAK","GOTO 200",,,TAB 10
;"SAVE","GOTO 9000",,,"CHANGE AL
LOPH.","GOTO 9100"
   9 STOP
  10 DIM T$(Z)
  20 LET P=1
  30 PRINT AT 1,1;"ENTER AN ALLO
PHONE (200 MAX.)"
  33 PRINT "    ENTER ""200"" TO
 SPEAK  "
  35 PRINT AT 10,0;"LAST ALLOPHO
NE WAS NUMBER ";P-1;"  "
  36 IF P=1 THEN GOTO 40
  37 PRINT AT 14,1;"LAST ALLOPHO
NE VALUE WAS ";CODE T$(P-1);"  "
  40 INPUT N
  45 IF P>Z-1 OR N>Z-1 THEN GOSU
B Z
  50 IF N>Z-1 THEN GOTO 5
  70 LET T$(P)=CHR$ N
  80 LET P=P+1
  90 GOTO 30
 202 RAND USR 16516
 205 FOR Q=1 TO P-1
 210 LET D=CODE T$(Q)
 220 POKE 16526,D
 230 RAND USR 16525
 250 NEXT Q
 260 POKE 16526,0
 270 RAND USR 16525
 280 RETURN
9000 SAVE "  "
9005 PAUSE 7
9010 GOSUB Z
9020 GOTO 5
9102 PRINT "TO CHANGE ALLOPHONE:
";"""LET T$(NUMBER)=CHR$ VALUE""
"
9110 FOR F=1 TO P-1
9120 PRINT "(";F;")";CODE T$(F);
" ";
9130 NEXT F
```

Z-SPEAK M.L. Locations:

16514	0		16528	23	*
16515	0		16529	62	Y
16516	62	Y	16530	0	
16517	152		16531	211	PEEK
16518	211	PEEK	16532	39	B
16519	55	R	16533	219	<=
16520	62	Y	16534	39	B
16521	15	?	16535	203	ACS
16522	211	PEEK	16536	127	?
16523	39	B	16537	40	C
16524	201	TAN	16538	250	IF
16525	62	Y	16539	24	/
16526	0		16540	235	FOR
16527	211	PEEK			

The following article appeared in the June 12/86 edition of the 'Newscientist' and is reprinted without permission. Let'em sue!



The decline of Uncle Clive

Knighted by Margaret Thatcher and widely considered as the most well-known scientist in Britain, the chairman of Sinclair Research seemed unstoppable. What went wrong?

Ian Adamson and Richard Kennedy

ON 7 APRIL 1986, Clive Sinclair sold off his name and rights to all existing computer products to Amstrad. With this single, dramatic move, he has effectively withdrawn from the market in home computers that his products played a major role in creating. When Sinclair signed the deal with Alan Sugar of Amstrad, Sinclair's products held the largest share (around 35 per cent) of this declining but still lucrative field. Sinclair's decision to opt out at this point illuminates several recurrent problems with his entrepreneurial style.

It also raises questions about the viability of Sir Clive's future operations. Alternative offers (favoured by Bill Jeffrey, the managing director of Sinclair Research) would have allowed the computer business to continue, and avoided many of the redundancies, which involved 95 per cent of the workforce. However, the price of the alternative deal was that Sir Clive would become a minority shareholder. The history of the decline of Sinclair's earlier company, Sinclair Radionics, subsequent to 1977, when Sinclair became a minority partner and the National Enterprise Board took the helm, showed that loss of absolute control, with the attendant obligation to take into account the views of others, soon becomes intolerable to a partner programmed to run a one-man show.

Sinclair's decade of fame and (mostly) favour, which resulted in both his knighthood and the less-inspiring sobriquet of "Uncle Clive" among the enthusiastic young purchasers of his high-tech toys, is mainly the result of the popular success of the "ZX" series of computers, from the ZX80 to the ZX Spectrum. While his predominant social contribution was to promote mass addiction to computer games, Sinclair has been widely misrepresented—not least by those centres of learning that gave him honorary degrees for "services to computer literacy and education"—as the man who brought computers into the home. This is not strictly true, if we understand by "computer" a functional tool with several related applications, whose design increases the ease or efficiency with which we can perform such tasks.

Sir Clive's marketing achievement was to downgrade the "concept" of a computer to the point where he could claim to provide one for less than the magical £100 mark. To this end, efficient keyboards and monitors, useful amounts of memory, effective filing and storage systems and the like were stripped away, to leave an affordable facsimile of a "computer". The market image was more important than what the computer could do, but the burgeoning industry in computer games provided an application which adolescents—young and old—eagerly seized on as the *raison d'être* for their new gadget. In the main, it was ignorance of genuine computer technology that fired the success of the ZX range, despite the availability of accessories that, albeit inefficiently, turned the Z80 processor chip at the heart of these up-market toys into the core of a useful machine.

The QL microcomputer marked Sinclair's attempt to move out of games and into the market of true home computers and computers for small businesses. The launch was a multi-faceted disaster. The original concept—an affordable, portable and genuinely useful computer, with a flat-screen display, adequate memory, built-in communications modem and "free" software to perform basic functions—was viable, as attested to by Amstrad's later success with its less ambitious purpose-built word processor, the PCW8256. However, Sinclair's penchant for idiosyncratic technologies led the company to waste time and effort on trying to produce a workable flat-screen display, using Sinclair's modified cathode-ray tube. Other delays in the development of the QL resulted from the choice of a new but inefficient microdrive

(a system which uses a fast audio cassette based on a continuous tape loop) as the medium for storing data.

Another characteristic of Sinclair, launching products before they were really ready, reached its apotheosis in the high-profile launch of the QL. At the time, not even the company's engineers had seen a complete working prototype. The consequent deficiencies in the machine, and the delay of around a year before the QL became an available and adequate computer, prevented the support of a maturing market which, although ready for a product of this type, was wary of investing in unconventional technologies. There was very little software available at the time of the launch. Poor quality control, from Sinclair's practice of contracting out the manufacture of his products, meant that too many machines did not work when they reached customers. Alan Sugar was quoted as saying that Sinclair's quality control was "atrocious". These shortcomings were also factors in the failure of the QL. The public did not want an "innovative" machine for which they would, as Sinclair's staff belatedly admitted, form a test-bed. They wanted a reliable, functional and staid application of proven technology.

The working man's boffin

The significance of Sir Clive's corporate decline, otherwise a minor event in the commercial world, is that he has worn the mantle of a great British inventor (the term he prefers), innovator and entrepreneur. He has been identified in the public eye with the visible application of microchip technology—what might be termed high-street high-tech. His corporate failings are likely to be equated with the failure of British "high technology" as commonly understood. In fact, Sir Clive's talents lie in absorbing and adapting original research to develop inexpensive products, often of dubious utility (witness the flat-screen pocket television and the C5 electric tricycle), and marketing them initially by mail order to increase his profit margins and finance his production. People confuse his valid commercial role (where validity can be measured in terms of corporate profits and marketing success), with the popular myth of the inventor beavering away in his lab. The image of Uncle Clive, the working man's boffin, is one that Sinclair's public relations machine has relentlessly promoted. We should base any assessment of Sir Clive's prospects not only on his success or otherwise in directing his R&D staff creatively to exploit existing technology, but also his recurrent problems with production and occasional failures, both technical and commercial.

What of the future for Sinclair Research? One major factor is cash flow. There may be no current debts, and some retained profit from the deal with Amstrad, but apparently the only income will be royalties received from ICL on sales of the modified Sinclair technology incorporated in the One-Per-Desk "workstation"—an intelligent telephone system—plus any of his own assets (much diminished by the fiasco of the C5) that Sir Clive chooses to make available. Any future must depend on bringing new and viable products to the market quickly, or attracting sufficient financial backing for longer-term ventures.

Leaving aside Sinclair's declared intention to become a "think-tank" for selected clients—a dubious role for the "visionary" who brought us the C5, one might think—Sinclair has three projects in prospect. On the computer front, the company is developing Pandora, a portable microcomputer, bearing a remarkable resemblance to the original QL, but by all accounts omitting microdrives in favour of 3·5-inch disk drives. That Sinclair is still revising the specification of this product suggests a state of confusion that does not bode well for the timely arrival of a competitive and functional product. Amstrad has first refusal on marketing the Pandora, and it is unlikely to take on anything unless it accords with Alan Sugar's dictum of "the right product, at the right price, and at the right time". On past form, Sinclair's R&D team seem unlikely to achieve this, leaving Sinclair Research the task of starting again with minimal resources and little credibility as a designer of computers, in a field where companies such as Epson, NEC and Tandy are expending intense technical effort.

The second project, emanating from Sinclair's low-profile telecommunications laboratory based in Winchester, is the cheap portable telephone for cellular networks. This will sell for less than £100, says Sir Clive, tilting at his magic figure once again. The product should be on the market in 18 months' time. This is manifestly a viable product, as Alan Sugar has also decided, since his company also intends to produce one. So the company jointly created by Timex and Sinclair to produce the telephone faces intense competition in an area where mere corner-cutting on the costs of components and production in the classic Sinclair style will not succeed in the long term—any more than Sinclair's computers faced up to Amstrad's challenge.

The third and most intriguing option—and the one which presents the most daunting technical challenges—is wafer-scale integration. This approach to the design of semiconductors offers financial savings by producing complete processing systems, laid down on a single wafer of silicon. It could also pave the way towards compact implementation of the new generation of processing techniques currently under development. The opening in 1983 of the prestigious Metalab research unit near Cambridge provided a base for the realisation of Sir Clive's visions, among them the much-publicised "Fifth Generation" project to develop artificial intelligence. Sinclair made patriotic noises about beating the Japanese at their own game—whatever that might be, and to what end. One of the elements of this fantasy was the investigation of wafer-scale integration.

Sir Clive's initiation into the world of the wafer took place in the summer of 1983, with the arrival of Ivor Catt who had answered Sinclair's advertisement for people to work at Metalab. Depending on who you talk to in the generally conservative semiconductor industry, Catt is either a crank or a visionary. For 20 years, he had been refining the theoretical foundations for a revolution in the semiconductor industry, and thus was tailor-made for the Sinclair project. Sir Clive took on Catt as a consultant and bought up Catt's patents to the wafer-scale process.

Catt himself has succinctly summarised the appeal of the wafer against existing chips and methods of manufacture:

"I noticed that the silicon wafer was a hundredth of the cost of the total system, so why not use that cheap commodity to build the system on the wafer instead of sawing it up to form separate circuits?"

Currently, the computer industry produces multiple chips on each wafer of silicon. The production process involves chopping up the wafer, testing each chip and then separating the working chips from a significant number of faulty chips. The working chips, after mounting, wiring and packaging in plastic, become part of a larger system mounted on a printed circuit board. Catt's alternative method involves preserving the entire wafer (including the faulty chips), which has internal connections between chips so as to eliminate the printed circuit board. It also avoids the need to test and encapsulate each chip. An electronic logic test built into the wafer circuitry allows each chip to be tested. If functional, the chip becomes incorporated in the circuit and then tests an adjacent chip. Faulty chips are bypassed as a spiral sequence of working chips is established on the wafer. The simplest form would be a memory wafer, but there is a potential to develop new, alternative computer architectures on the wafer.

Throughout the 1970s, the attempt to realise such a

product dominated the R&D strategies of many of the semiconductor giants. ITT, Texas Instruments and Burroughs, among others, sunk undisclosed fortunes into the dream. The kiss of death for the wafer as an investment option was the debacle of Gene Amdahl, formerly a designer with IBM. Amdahl's pursuit of a "supercomputer" based on the wafer-scale attracted around $240 million in backing from heavyweights that included Sperry, Digital Equipment and the Bull Corporation of France. By June 1984, Amdahl's company, Trilogy, had conceded that it could not overcome the problems of implementing its version of wafer-scale technology.

The failure of the big boys came as no surprise to Ivor Catt, whose approach had always radically differed from those of his rivals. Axiomatic to Catt's technique was a reduction in the number of connections made to the chip. In the latter stages of Amdahl's mega-wafer, the doomed prototype had an astounding 1200 pins packed on to its 6·4-centimetre design. Since, according to Catt's theoretical design, communication with the wafer passed through the first chip on the spiral, his chips were designed as bipolar components, thus needing only two pins as connections.

Investment in the wafer

After years in the wilderness, the National Research Development Corporation eventually funded Catt's theories in the late 1970s. This at least enabled him to patent their implications. At Middlesex Polytechnic, Malcolm Wilkinson ran a research team which examined the problems of implementing Catt's work. Wilkinson and his team went on to develop their research with Burroughs, where they successfully realised a provisional "test structure". At this point, the project fell foul of company politics. A new and predominantly American management, presumably with the experience of Amdahl fresh in their minds, wanted nothing to do with research into wafer-scale technology.

Sir Clive's interest in the technology could hardly have come at a more opportune moment. At the end of 1983, his relatively small, if momentarily profitable, company was able to poach not only Catt, but Wilkinson and a significant proportion of the team from Burroughs. In time, valuable additions from research groups working in related technologies from Plessey, TI, STL and DEC, would arrive.

Although association with wafer technology does nothing to enhance his self-styled stance as inventor and innovator, Sir Clive's support of these discredited research objectives was undoubtedly a canny move at a time when Sinclair Research was in a position to fund such an enterprise. In acquiring Catt, Wilkinson et al. and the wafer-scale patents, en masse and cut-price, it is arguable that Sir Clive was making an acceptable high-risk investment in the future. Sinclair's appropriation of Catt's work mirrors his advocation and adoption of Denis Gabor's work in the development of flat-screen technology at Imperial College in the late 1950s.

In a relatively short time it looked as if the investment would pay dividends. By spring 1985, Wilkinson's research suggested that the company could economically produce a wafer with a memory of half a megabyte for Sinclair's ill-fated QL microcomputer. Unfortunately, at the same time, the price of conventional memory chips fell dramatically. A few weeks later the financial crisis at Sinclair Research came to a head, precipitating the sequence of events which ended in the abortive "rescue" by Robert Maxwell. It seems likely that Sir Clive's preoccupation with the wafer-scale project exacerbated his lack of interest in the computer division of Sinclair Research, hastening a deterioration of the financial crisis to the point of no return. The fact that Sir Clive later turned down an offer that would have ensured the survival of the computer products tends to support the impression that, as far as he was concerned, home computers were history. However, while Sinclair may have been intrigued by the "intellectual challenge" of wafer-scale, it is equally clear that his much-lauded vision was decidedly myopic.

As soon as it became apparent that wafers with memories were unlikely to provide the funding for more sophisticated research, Robb Wilmot, chairman of ICL, was recruited onto the research board as troubleshooter.

Wilmot's brief was to drum up investment for the wafer-scale project. He soon recognised a potential that had eluded Sir Clive. Up until Wilmot's intervention, Sir Clive's exclusive direction for research into wafer-scales was towards the enhancement and development of Sinclair's existing technology and projects. Wilmot approached the problem of investment with the conviction that a solution to the production of wafer-scale chips could propel Sinclair Research into a position where the company would challenge the leaders of the semiconductor industry.

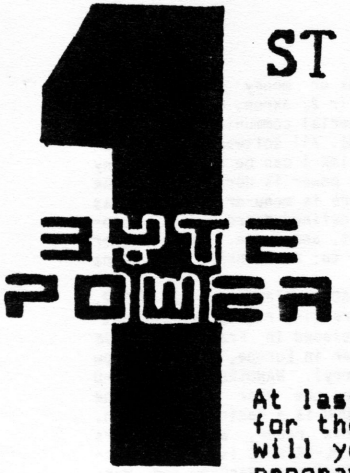
According to Wilmot, wafer-scale chips could revolutionise the design and production of all types of computers, and play a major role in communications products and defence systems (particularly radar equipment). In other words, the development of wafer-scale technology seemed poised to take Sinclair Research well out of its depth. Ironically, the company's capacity to raise finance was in a sense impeded by the exciting potential of its R&D resources. The public's recognition of Sinclair Research's managerial, marketing and financial shortcomings called into question its corporate ability to exploit effectively such an innovation. During the crisis in 1985, the odds were stacked against even ICL's well-connected supremo, Wilmot, coming up with a result. Malcolm Wilkinson sums up the difficulties facing the project, which are the same today as they were six months ago: "It's semiconductors, which are bad news to the City at the moment . . . It's wafer-scale technology, which has had some notable failures . . . and then there are the problems that Sinclair Research has got, and questions about the viability of the business side of it."

As a broker commented when the price of shares in Amstrad fell following the announcement of the deal with Sinclair, "The City . . . gets wobbles in the stomach when the name of Sinclair is mentioned." In the event, Wilmot failed to find the backers. A fortuitous deal with the Dixon chain of shops enabled Sir Clive's company to struggle on into the New Year until Alan Sugar came to the rescue in April.

With the Amstrad deal came the announcement that two separate companies would continue the projects on the radio telephone and wafer-scale technology. Sir Clive made it clear that he would have no part in the day-to-day running of either corporation. Barclays, the company's bankers, agreed to a limited investment package for wafer-scale technology with Sir Clive retaining a majority interest in the company, and the bank having an option to take up minority holdings. Desperately under-capitalised, it is hardly surprising that the team researching into wafer-scale technology is directing its attention towards distinctly unspectacular goals. The only project announced by the company is a wafer with a memory of 5 megabytes. It remains to be seen whether the experimental pilot production achieved in September 1985 can be sufficiently improved to create a product that can compete with conventional memory components in 1987.

Ivor Catt has always insisted that memory products are merely an incidental spin-off from the main work of wafer-scale development. The main purpose of wafer-scale technology, he believes, is to assist in the design of systems that will revolutionise computer architecture. A growing number of computer theorists are inclined to view these developments with interest, but Sinclair's company is hardly in a position to fund such ambitious research programes. So while wafers may yet hold a hope for the future, it seems unlikely that they hold out much hope for Sir Clive. □

Ian Adamson and **Richard Kennedy** are freelance authors and journalists. They have based this article on research for *Uncle Clive*, a critique of Clive Sinclair's technical and managerial practice, to be published by Penguin Books next September.



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Product/Dealer News

Gulf Micro Electronics, 1317 Stratford Ave., Panama City, FL 32404, has available a comprehensive software package on either cassette or special expanded version on disc for Aerco FD-68 users. Entitled SMART TEXT TS-2068, the author, Bill Jones, refers to the package as "Administrative Software". There are four operating programs, including a Data Base, a Word Processor, a Mailing List Manager, and a special Printer Patch program. Disc version comes with an automatic, self-adapting version of Printer Patch, and a Program Tutor file. Both versions come with full documentation. Price $34.00 ppd. When requesting information, ask about new versions for the Oliger Disk System and Zebra's OS-64 Cartridge.

Speaking of Aerco's popular disc system, there is a specialty user group catering to this system and a newsletter which is publsihed quarterly. Cost for a one year subscription is $15. For information, write to: David Hill, 1159 S. Shore Dr. #12, Holland, MI 49423.

You might also consider subscribing to a cassette-based magazine for the T/S 2068 called BYTE POWER. Each tape has programs ranging from Arcade games to Business programs. There are also reviews and programming tips. One tape (sample issue) is $5.50. Six issues, $29.99, and 12 issues for $49.99. Send check or money order to: Byte Power, 1748 Meadowview Ave., Pickering, Ontario, Canada L1V 3G8.

Sprite graphics, the key to successful game programming is an area that hasn't been addressed too often for the 2068. Now two programmers (from separate states) have collaborated on a new software development package called SPRITES 2068. It contains several machine code utilities, demos, and a 34 page manual. Priced now at $19 ppd. Send check or money order and inquiries to either: Vern Tidwell, 1303 Whitehead St., Key West, FL 33040, or Ron Ruegg, 37529 Perkins Road, Prairieville, LA 70769.

Beaver Computer Products, 999 Munroe Ave, Winnipeg, Manitoba, Canada R2K 1J4, the company that features "extended video mode" software for the T/S 2068, has some new titles. "Beaver Writer" is touted as the first 80 column word processor for the 2068, and "Character Font Generator" lets you add character (pun intended) to programs and text. Prices: Beaver Writer, $25 (U.S.), Character Font Generator, $15 (U.S.). A catalog which includes a demo tape is available for $1.50 (U.S.).

Some very exciting software has been developed by another Canadian company called Novelsoft (106 Seventh Street, Toronto, Ontario, Canada M8V 3B4). Some of you may be familiar with David C. Ridge, who has had his ARTWORX marketed in Great Britain for the Spectrum, and is currently the Senior Programmer for Novelsoft. Now there is an improved version of his popular graphics package for the T/S 2068 called ARTWORX version 1.1. It is priced at $19.95 (U.S.) + $3 postage. Another program being offered for the 2068, and should sell quite well here in the states, is a Basic Compiler called TIMACHINE and is reported to outperform any compiler on the market today for the Timex. Timachine will handle all Basic commands (except I/O), and will convert your program to fast machine code in seconds. The program is priced at $19.95 (U.S.) + $3 postage.

A.F.R. Software, 1605 Pennsylvania Ave. #204, Miami Beach, FL 33139, has three software programs for the T/S 1000/1500/ZX81 (and versions for the 2068). ZX-TEXT is a word processor, ZX-CALC is professional spreadsheet program and accounting model package, and ZX-CALENDER is time-management program. All three titles are priced at $16.95 each + $3 postage.

BF Kimbrough KEL "In-Memory Operating System Ver. 1.0" for the T/S 1000 and ZX81, is an interesting software utility. It is written in relocatable machine code and operates in BASIC or user defined area. The operating system also features ten user-definable function keys. Price: $7.97. Send check or money order to: BF Kimbrough, 723 Roselle Ave. Flr 2, Akron, OH 44307.

COMLINK I is an RS-232 serial communications interface for the T/S 1000 and ZX81. All software is in EPROM for instant loading, and COMLINK I can be used with any 300 baud modem. All operating power is derived from the Sinclair. The advanced software is menu-driven and has many features including user defined Macro keys, auto-repeat, expanded character set, and more. For further information and prices, write to: A. Eckhardt, 918 Anna Street, Boalsburg, PA 16827.

Curry Computer, PO Box 5607, Glendale, AZ 85312, has obtained the exclusive marketing rights to an outstanding line of software developed in France. Pyramide Software for the QL, is popular in Europe, and has now come to America (thanks to Curry). WANDERER is a 3-D space arcade game that requires the user to wear the supplied red/blue glasses. VROOM is a racing simulation. The driver sits in a Grand Prix racer, and maneuvers around five different tracks. QL-PEINTRE is a graphic-design package that is very similar to MacDraw and MacPaint. OTHELLO is a 3-D (no glasses required with this one) version of the classic game. Write to Curry for a complete catalog with prices.

PCIMPORT is a program that permits your QL to download ASCII files from an IBM PC via direct link. This permits the transfer of documents, program source code or any other ASCII encoded file from the IBM PC to the QL. Also included is a conversion program that converts Micro Soft Basic to QL Super Basic. For a catalog of QL items and prices (including PCIMPORT), write to: MIN-NY Electronics Inc., 7332 Douglas Dr., No. Brooklyn Park, MN 55443.

A+ Computer Response of Keene, New Hampshire, has added five new American QL dealers to their list, making a total of 17. The new dealers are: Markel Enterprises, PO Box 2392, Secaucus, NJ 07094; C.W. Associates, 419 N. Johnson St., Ada, OH 45810; Variety Sales, 325 W. Jersey St., Elizabeth, NJ 07202; Quantum Computing, 8 Gillen Street, Mine Hill, NJ 07801; and Info-Mation, RR#1 Box 260, California, MO 65018.

The Second Annual Mid-West Timex/Sinclair Computerfest will be held in Indianapolis, Indiana on the first weekend of May 1987. The core of organizers for the Cincinnati show are currently slating plans for the 1987 "reunion" of dealers, exhibitors, and Sinclair fans from the mid-west and virtually everywhere else. If you would like to obtain some preliminary information...write to: Frank Davis, 513 East Main St., Peru, IN 46970 (send a S.A.S.E.) or call (evenings) 317-473-4885. There has been interest expressed in T/S Computerfests for the New York/New Jersey area, and for the west coast (possibly San Francisco?), but so far, nothing definite has been planned.

"Commrades...all together now...enter the keyword [PRINT] and followed by CARL MARX in quotations." And its all for the good of the party! Whats going on here? The Polish government is about to receive 800,000 Timex 2068's and 200,000 FDD-3000 Dual 3" Disk Drive Systems, to be used in public schools and institutions. The "iron curtain" deal was recently struck between the Timex Corporation and a Polish industrial firm (through a neutral distribution agency. O.K., now how many issues of TDM should be shipped?

The temporary shortage of three inch (Hitachi type) floppy disks is over...and supplys are very good. The following companies have the "special" disks in stock for immediate shipping: Zebra Systems Inc., (718) 296-2385; Peripherals Direct, (312) 498-9244; Speedysoft (London, England) 01-789-8546; various other dealers around Great Britain. Resulting from a recent deal struck between Amstrad International and Sears, various selected Sears outlets will carry the 3" disks.

The following is reprinted from The Plotter, Vol 2, # 7 & 8.

EXTENDED BASIC FOR THE TS 1000

by Dick Wagner, CCAT/S

Extended Basic will put new life into your computer, give you FAST performanc, and will provide you with some new programming tools now used on the 2068 computer. Extended Basic is a program that uses machine code stored in REM 0 and is accessed ANY time in your program with REM and then the command written out (no keywords). Thus you can mix Sinclair Basic with Entended Basic freely, use Extended Basic or Sinclair Basic alone. The interpreter is called with GOSUB 0 in the line ahead of the REM Extended Basic statement.

There are 22 new commands at your disposal, you can put multiple commands and statements in a line, you can use all 24 lines, and PRINT automatically.

Here are some of the commands that make this program so interesting-- DRAW, UNDRAW, RESTORE, DATA, READ, FILL, MOVE, CIRCLE, UNCIRCLE, PAPER, UNPAPER, and SCROLL. Some of these are duplicates of 2068 commands.

So called "standard" commands such as LEFT$, MID$, and RIGHT$ are provided which is helpful for other makes of computers. DATA, READ, and RESTORE permit the use of a DATA statement and then READ it into a program. Thus you can use many 2068 programs using such data input methods.

INPUT and OUTPUT are new to you. KEY replaces INKEYS$ while IN and OUT permit access to the rear port to control peripheral equipment. KEY will return values of multiple key presses. IN and OUT works in either FAST or SLOW modes and control and get data from any I/O mapped device and maintain a continuous display.

There are 11 ERROR CODES that indicate the kind of error and where it happened. This program can be merged with any program of less than 8K length and be put into REM 0 so it works properly.

EXTENDE BASIC is available on cassette from Thomas B. Woods for U.S.$19.95 + $1.50 p&h. Send to P.O. Box 64, Jefferson, NH 03583.

<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<<

2068 TIPS

-- To find out how much memory you have when using the SPECTRUM ROM try this line: PRINT 65536 - USR 7962. The result is the same as the FREE command on the 2068.

-- When saving a multi-part program, insert POKE 23736,181 between the SAVE statements and the computer will then SAVE all the parts of the program without the " Start the Tape" prompt.

-- POKE 23756,0 will change the first line of a program to Line 0.

-- POKE 23692,255 will provide automatic scrolling on long text programs.

We are presently exchanging newsletters with the following Sinclair User Groups. If anyone wishes to read any of the newsletters on file just let me know...Rod.

*TRIANGLE SUG
)OUGLASS DEWEY
06 JAMES ST.
ARRBORO,NC 27510

*BOSTON COMPUTER SOCIETY
SINCLAIR SECTION
ONE CENTRE PLAZA
BOSTON, MA 02108

*GAINESVILLE TS USERS
C/O JOE WILLIAMSON
3708 NEWBERRY RD.
GAINESVILLE, FL 32607

.S.U.G. of CINCINNATI
FUNSTON LN.
NCINNATI, OH 45218

*N/E FLORIDA TS USERS GROUP
C/O JOHN KUHN
1707 KING ST.
JACKSONVILLE, FL 32204

*BOSTON AREA TS USERS
C/O RICK HEISER
4 OX ROAD
BILLERICA, MA 01820

*VICTORIA SYNC ASSOCIATION
MR.D SHOOLIGIN
942 CLOVERDALE AVE.
VICTORIA, BC V8X 2T6

*ZX USERS GP OF NEW YORK
C/O G.CORONADO
BOX 560 - WALL ST.
NEW YORK, NY 10005

*SOUTH BAY COMPUTER CLUB
C/O JOHN PETERSON
2316 WALNUT AVE.
MANHATTAN BEACH, CA 90266

*CAPITOL AREA T.S.U.G.
P.O.BOX 725
BLANDENBURG, MARYLAND 20710

*PORTLAND AREA TS USERS GP
C/O KEVIN FOWLER
6854 N.E. MULTNOMAH
PORTLAND, OR 97213

*HAMPTON ROADS T.S.U.G.
17 REX AVE.
PORTSMOUTH, VA 23702-2925

*TIME DESIGNS
29722 HULT RD.
COLTON, OREGON 97017

*ATSU-HOME COMPUTER USERS
C/O RAY THORTON
P.O.BOX 16274

*L.I.S.T.
P.O.BOX 438
CENTERPORT, NY 11721-0438

*TORONTO TS USERS
P.O.BOX 7274, STN. A
TORONT, ONT M5W 1X9

*SOUTHWESTERN T.S.U.G.
C/O CARL MILES
1233 SANDLER ST. N.E.
ALBUQUERQUE, NM 87112

*STHN VA T/S COMPUTER USERS
C/O GARY PRESTON
RT 1,BOX 21
GLADE HILL, VA 24092

*SINCLAIR USERS MAGAZINE
C/O 3224 NW 30th AVE.
GAINSVILLE, FL 32605

*SINCLAIR COMPUTER USERS SOC
SINCUS NEWS
P.O.BOX 36
JOHNSON CITY, NY 13790

*NEWSLETTER EXCHANGE
SVSTUG (TIMELINEZ/SINCLINK)
6675 CLIFFORD DRIVE
CUPERTINO, CA 95014-4530

*PORTLAND AREA USERS
4798 S.W. 201st. AVE.
ALOHA, OREGON 97007

*CLACKAMAS COUNTY AREA
TS GROUP; C/O ROD GOWEN
1419 1/2 7TH ST.
OREGON CITY, OR 97045

*CIRCLE CHESS TS USERS
C/O A.F.STANONIS
BOX 63
DES PLAINES, IL 60017

*T/SUG OF FORT WORTH
C/O DAVID BAULCH
4424 GEDDES AVE.
FT.WORTH, TX 76107

*CENTRAL PA T/S USERS GROUP
SYNAPSE-C/O R.HEIL
1525 N. ASHWICKEN CT.
STATE COLLEGE, PA 16801

*T.S. HORIZONS
2002 SUMMITT ST.
PORTSMOUTH. OHIO 45662

*THE GREATER CLEVELAND
SINCLAIR USERS GROUP
6514 BRADLEY AVE.(DOWN)
PARMA, OHIO 44129

*T.U.G. of LAS VEGAS
C/O J.SUMPOLEC
2405 HOWARD DR.
LAS VEGAS, NV 89104

*SMUG BYTES
C/O DAVE FRANSON
2702 N. MURRAY AVE. NO.1
MILWAUKEE, WI 53211

*T/S USERS-MILE HIGH CHAPTER
914 S. VICTOR WAY
AURORA, CO 80012
.

*TSUG OTTAWA/HULL
1268 MAITLAND AVE.
OTTAWA, ONT., K2C 2C6
.

*WMJ DATA SYSTEMS
4 BUTTERFLY DRIVE
HAUPPAUGE, NY 11788
.

*G.U.T.S. DE MEXICO
APARTADO POSTAL 75-170
C.P. 07300
MEXICO, D.F.

*HAMPTON ROADS TS USERS GP
C/O DAVID ALFORD
112 KOHLER CRESCENT
NEWPORT NEWS, VA 23606

*KEYBOARDS
C/O PAUL KALINSKI
12736 N. 17TH ST. APT I-212
TAMPA, FL 33612

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THIS IS A LIST OF PHONE NUMBERS THAT ARE ANSWERED BY A COMPUTER. MOST ARE BULLITON BOARDS.
SOME BELONG TO COMPANIES (NO CRACKING, OKAY). SOME BELONG TO UNKNOWN COMPUTERS - MOST LIKELY FEDERAL GOVT SYSTEMS.
THIS LIST IS NOT COMPLETE BY A LONG SHOT BUT SHOULD KEEP YOU MODEMERS BUSY FOR A WHILE.
MAKE SURE YOU GIVE CITY-LINK A CALL AND HAVE A LOOK AT THE VARIOUS DISCUSSIONS HOSTED BY OUR OWN JOHN BROHMAN.

B.B.S. Name	Number
Unknown	669-2215
Unknown	669-2234
Unknown	669-2377
Unknown	669-2402
Unknown	669-2460
Unknown	669-2602
Unknown	669-4527
Hav-Info	683-1991
Soto Blue C64	683-1914
Sota Main	688-5061
Datapac node	689-8601
Twilight Zone	731-2724
Element County	731-6966
Ed Net	734-3282
Ground Zero	736-7823
Fast80 #3	738-2773
Compuserve node	738-5157
Turbo BBS	738-7811
Ibliss BBS	872-2316
Unknown	874-8350
Unknown	875-9788
Oneiro's Oracle	876-4868
Swap Shop	888-0052
Unknown	943-0734
Unknown	946-0955
~~~~~~

M.C.R. ----------222-1551
Citylink ----------222-2000
Microstat ----------224-2337
9067 UBC NIUM ----------228-9051
Medical Services ----------261-5150
Unknown ----------261-6020
Sparkboard ----------261-9149
Midi BBS ----------263-8487
Blackboard ----------263-8573
Missing Link ----------270-3657
CCC BBS ----------271-1082
Startrader ----------272-2549
Disk Box ----------274-7900
B.A.M.H. Handicapped ----------291-0542
V.S.E. ----------321-1130
Unknown ----------321-2161
ASCII Express ----------321-4581
Castle Arrrrrgh ----------327-9494
LG73 ----------327-9762
New (after 10pm) ----------421-2301
Buy & Sell ----------433-6713
Hardcore (answer) ----------438-2011
Hardcore (node) ----------596-2011
Hardcore ----------873-2011
Unknown ----------597-1964
Dillingham Corp ----------669-0570
Unknown ----------438-2131
Unknown ----------475-7699
Fast80 #5 ----------520-1470
Peephole ----------526-3587
Unknown ----------531-6473
Unknown ----------534-1605
OS-9 ----------536-0024
Unknown ----------536-8533
Unknown ----------574-3836
Real State ----------574-0015
Delta80 ----------585-0680
Delta80II ----------585-5614
Unknown ----------588-4375
OTO BBS ----------589-0592
Unknown ----------590-0851
Fast Master ----------594-7398
Fantasia ----------594-8165
Unknown ----------669-0906
Unknown ----------669-0960
Unknown ----------669-1931

THE ZEEPER SPEAKS...

Greetings to my favorite orphans,

Oh I can hear the groans now. Here comes the Zeeper to further humiliate us. Well, rest assured that I have managed to contain my smugness over the demise of one Sir Clive Sinclair from the computer world. There will be no I-told-you-so's or muffled giggles. The Zeeper is much too big a person for that sort of thing. In fact, I was raised to be kind to those less fortunate than myself.

I thought you would like to hear what has been happening in the world of real computers. I have just returned from the annual convention of Zeepers International. Yes, there are many Zeepers in the world of computers. In fact, you will find our handiwork wherever people congregate around any brand of computer. At our convention, we compared notes and had a great time. Yours truly, won an award for single-handedly picking off Clive Sinclair. There were others even more prominent.

Over in Amiga land we were very busy making sure that this super-duper mega graphics, all-in-one, humdinger computer from Commodore received the same level of after-market support as the Edsel. That was called the Great Deception Campaign. The Amiga has GREAT GRAPHICS- if you buy the very expensive extra memory to make it work! The Amiga is IBM COMPATIBLE- if you can find a software emulator that is faster than an epileptic slug or buy a Sidecar hardware add-on for mega-bucks! The Amiga takes a HARD DRIVE- and about $2000.00 ! The Amiga does MULTI-TASKING- if you have about six months to do nothing else but figure out how to make it work!

Apple land is completely under Zeeper control. We thought they had learned their lesson with LISA. That was not the case. Enter MacIntosh. A cute little machine with a Mouse. We made sure it was absolutely impossible to do anything on your own with that silly little rodent. We made sure it was so tied up with source code spaghetti and legal restrictions that nobody would support it. Apple will never recover.

IBM is not forgotten either. BIG BLUE land requires a full division of Zeepers. Now IBM is not an opponent to be taken lightly. We are talking about the Great Grand Mogul of the computer world. Only the most experienced Zeepers get on the BIG BLUE team. There is an entirely different tactic used with BIG BLUE. First, every time they come out with a new machine of any significant value, we make sure it is cloned to death. Everybody and their dog can make an IBM PC compatible better and cheaper than IBM, with a lot more features. Next, we made it the industry standard. This was not the blessing it would appear to be. We also made it the most boring of machines. Everyday all around the world, millions of people are doing very boring menial little jobs with an IBM PC. They are using boring LOTUS and boring SYMPHONY and particularly boring WORDSTAR and DBASE. There is an entire industry devoted to making endlessly boring spreadsheets, data bases, and word-processors. IBM PC users are doomed to a life of tedious boredom.

There aren't many fun

things to do with an IBM PC. The BIG BLUE division is ever vigilant to make sure that "fun" software writers stay un-discovered. In fact, our division has been so successful that it cost an arm and a leg to advertise in IBM glossy magazines so that the "fun" writers can't afford to advertise. The only way to get the real fun stuff is if you get freeware on a BBS. The fun guys are actually begging you to pay them after you get the stuff for free. It's sad. Even I couldn't be that cruel. We have coined the phrase Incredibly Boring Machine. The next time you see a wretched little data entry clerk hunched over a desk with eyes permanently glazed over you'll know how effective the BIG BLUE division has been.

So you see, we Zeepers haven't just singled out you lowly Timex users. We spread it around. You guys are just my particular specialty. Don't think that because I finally stomped Sir Clive into the mud face first, that I am finished with you. Not by a long shot.

T/S 2068 SOUND ROUTINES

by- R. Lussier

GUNSHOTS:-

```
10 SOUND 6,15;7,7;8,16;9,16;
        10,16;12,16;13,0
20 PAUSE 60
30 GOTO 10
```

WHISTLING BOMB:-

```
10 SOUND 7,62;8,15
20 FOR I=50 TO 100
30 SOUND 0,I;PAUSE 3
40 NEXT I
```

EXPLOSION:-

```
10 SOUND 6,6;7,7;8,16;9,16;
        10,16;12,56;13,8
20 PAUSE 90
30 SOUND 8,0;9,0;10,0
```

****

Dial-by-voice phone on line

A speech recognizer patented this week has made possible a new dial-by-voice car telephone to be introduced this summer. Three staff scientists at AT&T Bell Laboratories, Murray Hill, N.J., were awarded patent 4,587,670 for the mathematical procedure, which is said to eliminate 90 per cent of the computation previously required to identify spoken sounds.

The new cellular phone, developed by AT&T Consumer Products as AT&T 1280, will enable a motorist to dial a number by pronouncing a person's name. Twenty different numbers can be stored. The qualities of each sound are compared statistically rather than by comparing recorded patterns. The inventors are Stephen E. Levinson, Lawrence R. Rabiner and Man M. Sondhi.

PLAYING WITH ELECTRICITY (#x) by Harvey Taylor

In the course of developing my Fractal program, I have developed data compression/expansion procedures for use with QL graphics screens. The price one pays for high resolution in a bit mapped display is lots of memory used in the frame buffer, the display file, the video ram....whatever you want to call that portion of memory devoted to the display. In particular, the QL uses 32K bytes for the primary screen. A little bit of arithmetic will tell you that is 256K bits. The maximum resolution is 512x256, ie. 128K points; which means that the QL uses 2 bits per pixel in mode 4 and has 4 colours. In mode 8 (256x256 screen), there are 4 bits per pixel which would give 16 colours, except that one bit is assigned to FLASH, so there are only (2^3=)8 colours.

The practical problem is that every time you save a whole screen of information it takes up 32K of mass storage. On floppy disks you can live with these numbers, but on microdrive the story is different. Each microdrive can hold about 110K or three screens & precious little else.

The practical solution is data compression. The method I used, called run length encoding, is the height of simplicity. Begin at the start of the screen. Look for sequences of more than three consecutive bytes which are the same. If you come across succeeding bytes which are different, save the individual bytes. When you find more than three bytes the same, save a flag byte, a count of the bytes and the byte itself. Thus using this method, a complete screen of one colour could be saved in three bytes. In practice, the amount of compression depends upon how much of the screen is the same colour.

You might have wondered how the program reacts if it comes across a single byte which is the same as the flag byte. Clearly one must choose a flag byte which is not common. However in the unlikely event of this happening, the saving procedure appends a length of zero which tells the loading procedure "This is not a flag byte."

The code below is extensively commented. Drop me a line & a blank microdrive if you wish a copy of the code.

```
*               SSAVE, SLOAD
*                 by Harvey Taylor
*
                GET     'flp1_STANDARD_HDR6'
CN_ITOHW        EQU     $FC
IO_FSTRG        EQU     3
FLAG            EQU     $1234
SET_UP_PROC     LEA     PROC_TABL,A1    * Link procedures into Superbasic
                VECT_N  BP_INIT,A2
                MOVEQ   #0,D0
                RTS
PROC_TABL       DC.W    2               * # OF PROCEDURES
                DC.W    SSAVE-*         * POINTER
```

```
                DC.B    5               * # LEN OF NAME
                DC.B    'SSAVE'         * NAME!
                DC.W    SLOAD-*
                DC.B    5
                DC.B    'SLOAD'
                DC.W    0               * END OF PROC
                DC.W    0               * # OF FUNCTIONS
                DC.L    0               * END OF TABLE
                CNOP    0,2
SSAVE           CMPA.L  A5,A3                   * ANY PARAMETERS?
                BEQ     BP_ERROR
                VECTOR  CA_GTSTR,A2
                CMPI.W  #1,D3                   * NUMBER OF PARAMETERS
                BNE     BP_ERROR
                BSR     OPEN_NCHAN
                BNE     ERR_EXIT
SCRSAVE         MOVE.L  #$20000,A3
                LEA     BUF_MARK,A4                     * END OF BUFFER MARK
B_LOOP          LEA     BUFFER,A5
                MOVEQ   #0,D2                           * BUFFER COUNT.W OF BYTES
FIRST_TST       MOVE.W  (A3),D3                         * GET THE WORD TO CHECK
                CMP.W   2(A3),D3
                BNE     INSERT_ONE
                CMP.W   4(A3),D3
                BNE     INSERT_TWO
* AT THIS POINT THERE ARE NOW AT LEAST 3 OF THE SAME WORDS IN A ROW
CHK_FLAG        CMPI.W  #FLAG,(A3)                      * FLAG?
                BNE     REGULAR
                MOVE.W  #FLAG,(A5)+                     * INSERT FLAG
                MOVE.W  #0,(A5)+                        * ZERO COUNT
                ADDQ.W  #4,D2
                BRA     SCR_TEST
REGULAR         MOVEQ   #3,D1                           * SET UP WORD COUNT.W
                ADDQ    #6,A3
R_LOOP          CMP.W   (A3),D3                 * ARE THE NEXT BYTES THE SAME?
                BNE     INSERT
                ADDQ    #1,D1                           * WORD COUNT.W
                ADDQ    #2,A3
                CMPA.L  #$28000,A3
                BLT     R_LOOP
INSERT          MOVE.W  #FLAG,(A5)+                     * FLAG
                MOVE.W  D1,(A5)+                        * REPEAT COUNT.W
                MOVE.W  D3,(A5)+                        * OBJECT
                ADDQ.W  #6,D2                           * INCREASE BYTE COUNT.W
                BRA     SCR_TEST
INSERT_ONE      MOVE.W  D3,(A5)+
                ADDQ    #2,D2                           * BUFFER BYTES COUNT.W
                ADDQ.L  #2,A3
                BRA     SCR_TEST
INSERT_TWO      MOVE.W  D3,(A5)+
                MOVE.W  2(A3),(A5)+
                ADDQ    #4,D2
                ADDQ    #4,A3
SCR_TEST        CMPA.L  #$28000,A3
```

```
                BGT     SAVE_STRG
BUF_TEST        CMPA.L  A4,A5                   * ARE WE PAST THE MARK
                BLT     FIRST_TST
SAVE_STRG       MOVE.L  D7,A0                   * FILE CHAN ID
                MOVEQ   #-1,D3                  * TIMEOUT
                LEA     BUFFER,A1               * D2 ALREADY SET UP
                QDOS    IO_SSTRG,3
                BNE     ERROR
                CMPA.L  #$28000,A3              * PAST END?
                BLE     B_LOOP
                BRA     CLOSE_UP                * CLOSE UP & QUIT
*
SLOAD           CMPA.L  A5,A3               * ANY PARAMETERS?
                BEQ     BP_ERROR
                VECTOR  CA_GTSTR,A2     * QDOS ROM call leaves string on stack
                CMPI.W  #1,D3               * NUMBER OF PARAMETERS
                BNE     BP_ERROR
                BSR     OPEN_OCHAN
                BNE     ERR_EXIT

                MOVE.L  #$20000,A5              * DISPLAY BUFFER
GET_STRG        MOVE.W  #$200,D2                * BUF LEN.W
                BSR     FETCH
                BEQ     GS_CONT                 * if OK, go ahead
                CMPI.L  #-10,D0                 * End of File?
                BNE     ERR_EXIT
                LEA     BUFFER,A2
                CMPA.L  A2,A1
                BEQ     CLOSE_UP                * IF EOF & DATA, PROCESS
GS_CONT         LEA     BUFFER,A2
CHK_WORD        CMPI.W  #FLAG,(A2)
                BEQ     PROCESS
                MOVE.W  (A2)+,(A5)+             * PUT WORD ON SCREEN
                CMPA.L  A1,A2                   * END OF BUFFER?
                BGE     GET_STRG
                CMPA.L  #$28000,A5
                BGT     CLOSE_UP                * IF > END OF DFILE
                BRA     CHK_WORD
* at this point a flag word has been seen
PROCESS         ADDQ.L  #2,A2
                CMPA.L  A1,A2                   * END OF BUFFER?
                BGE     GET_COUNT
                MOVEQ   #0,D6                   * CLEAR TOP BYTES
                MOVE.W  (A2)+,D6                * GET COUNT
                BEQ     ZEROCOUNT
                CMPA.L  A1,A2
                BGE     GET_OBJECT
                MOVE.W  (A2)+,D5                * GET OBJECT
BUILD_LOOP      SUBQ.W  #1,D6                   * ADJUST FOR DBRA
BU_LOOP         MOVE.W  D5,(A5)+                * PUT OBJECT ON SCREEN
                DBRA    D6,BU_LOOP
END_TEST        CMPA.L  A1,A2                   * END OF BUFFER?
                BLT     CHK_WORD
                BRA     GET_STRG
ZEROCOUNT       MOVE.W  #FLAG,(A5)+
```

```
                BRA     END_TEST
GET_COUNT       MOVE.W  #2,D2                   * BUF LEN.W
                BSR     FETCH
                BEQ     GC_CONT
                CMPI.L  #-10,D0                 * EOF?
                BNE     ERR_EXIT
                CMPA.L  A1,A2
                BEQ     ERR_EXIT
GC_CONT         LEA     BUFFER,A2
                MOVE.W  (A2)+,D6                * COUNT
                BEQ     ZEROCOUNT
GET_OBJECT      MOVE.W  #2,D2
                BSR     FETCH
                BEQ     GO_CONT
                CMPI.L  #-10,D0
                BNE     ERR_EXIT
                CMPA.L  A1,A2
                BEQ     ERR_EXIT
GO_CONT         LEA     BUFFER,A2
                MOVE.W  (A2)+,D5                * OBJECT
                BRA     BUILD_LOOP
FETCH           LEA     BUFFER,A1
                MOVEQ   #-1,D3                  * TIMEOUT
                MOVE.L  D7,A0                   * CHAN ID
                QDOS    IO_FSTRG,3              * fetch string
                RTS
OPEN_OCHAN      MOVEQ   #0,D3                   * OLD EXCLUSIVE FILE
                BRA     OPEN_CHAN
OPEN_NCHAN      MOVEQ   #2,D3                   * NEW EXCLUSIVE FILE
OPEN_CHAN       LEA     0(A6,A1.L),A0           * A0=> FILENAME
                MOVEQ   #-1,D1                  * THIS JOB
                QDOS    IO_OPEN,2
                BNE     OC_EXIT
                LEA     FILE_CHAN,A1
                MOVE.L  A0,(A1)                 * CHAN ID
                MOVE.L  A0,D7
                MOVEQ   #0,D0
OC_EXIT         RTS
BP_ERROR        MOVEQ   #-15,D0
ERR_EXIT
                VECT_N  UT_ERR0,A2
                BRA     EXIT
ERROR
                VECT_N  UT_ERR0,A2
CLOSE_UP        LEA     FILE_CHAN,A1
                MOVE.L  (A1),A0
                QDOS_N  IO_CLOSE,2
EXIT            MOVEQ   #0,D0
                RTS
*
FILE_CHAN       DS.L    1
BUFFER          DS.L    128                     * POSSIBLE SECTOR SIZE + ?
BUF_MARK        DS.L    16
                END
```

WORKING WITH THE ZX81/TS1000 DISPLAY FILE

By Ken Abramson

The April, 86 Newsletter (Page 4) gave a neat little drawing program called, "PAINT." Here is the original listing:

```
  10 REM PAINT
  11 REM PHIL DOUGHTY
         VIDIOM
         P.O. BOX 3118
         PROVIDENCE, RI 02906
  15 LET Z=0
  20 LET X=5
  30 LET Y=5
  35 INPUT S$
  40 PRINT AT Y,X;S$;
  50 IF Z THEN PRINT AT Y,X;" ";
  60 IF INKEY$="5" AND X>0 THEN
LET X=X-1
  70 IF INKEY$="8" AND X<31 THEN
 LET X=X+1
  80 IF INKEY$="6" AND Y<21 THEN
 LET Y=Y+1
  90 IF INKEY$="7" AND Y>0 THEN
LET Y=Y-1
 100 IF INKEY$="0" THEN LET Z=NO
T Z
 115 IF INKEY$="C" THEN GOTO 35
 120 GOTO 40
9998 SAVE "PAINT"
9999 RUN
```

PROBLEM:

When the drawing is finished, you must BREAK the program in order to COPY the screen to the printer. Once your beautiful drawing has been printed, it will disappear when you try to restart the program.

Many people do not realize that the Display File (screen memory) can easily be saved by saving while the program is running and the drawing is still on the screen. Add the following line to the above program:

```
117 IF INKEY$="S" THEN SAVE "PAINT"
```

Just press "S" while the finished drawing is still on the screen and your drawing will be saved. (By the way, delete the last two program lines; lines 9998 and 9999 are no longer needed.) The drawing should come back on the screen after being saved, and you can continue working on it.

The trouble remains, however, that once you BREAK the program to COPY to the printer, you cannot restart the program without losing your original screen. What to do? Simply insert your COPY command into the program as another program line:

```
118 IF INKEY$="Z" THEN COPY
```

You can now retain the screen after COPYing, save your screen on tape at any stage and resume working on it at any stage.

Bingo! we now have a practical drawing program. Now add a little instruction menu for user friendliness and there you have it... a powerful little drawing program in less than 1k!:

```
  10 REM **ZXDRAW**
         BY KEN ABRAMSON

  20 REM  BASED ON THE PROGRAM
         "PAINT" BY PHIL DOUGHTY

  30 REM  THIS PROGRAM TAKES
PHILS PROGRAM SEVERAL STEPS
FURTHER BY ALLOWING YOU TO SAVE
A SCREEN DRAWING, HARDCOPY IT,
AND CONTINUE WORKING ON IT.

  40 CLS
  50 PRINT TAB 7;"ZXDRAW CONTROL
 KEYS",TAB 7;"
","5 -MOVES CURSOR LEFT",,,"6 -
MOVES CURSOR DOWN",,,"7 -MOVES C
URSOR UP",,,"8 -MOVES CURSOR RIG
HT",,,"0 -DRAW (CURSOR NOT FLASH
ING)","   -ERASE (CURSOR FLASHING
)",,,"C -CHANGE DRAWING CHARACTE
R",,,"M -INSTRUCTION MENU",,,"S
-SAVE SCREEN DIRECTLY TO TAPE",,
,"Z -COPY TO PRINTER"
  60 PRINT AT 21,0;"PRESS ENTER
TO BEGIN DRAWING"
  70 INPUT P$
  80 SLOW
  90 CLS
 100 LET S$="*"
 110 LET Z=0
 120 LET X=15
 130 LET Y=10
 140 GOTO 160
 150 INPUT S$
 160 PRINT AT Y,X;S$;
 170 IF Z THEN PRINT AT Y,X;" ";
 180 IF INKEY$="5" AND X>0 THEN
LET X=X-1
 190 IF INKEY$="8" AND X<31 THEN
 LET X=X+1
 200 IF INKEY$="6" AND Y<21 THEN
 LET Y=Y+1
 210 IF INKEY$="7" AND Y>0 THEN
LET Y=Y-1
 220 IF INKEY$="0" THEN LET Z=NO
T Z
 230 IF INKEY$="C" THEN GOTO 150
 240 IF INKEY$="S" THEN SAVE "ZX
DRAW"
 250 IF INKEY$="Z" THEN COPY
 260 IF INKEY$="M" THEN GOTO 40
 270 GOTO 160
```

PROBLEM:

Can more than one screen be drawn, stored, and saved using a single program? So far, our drawing program is capable of saving the Display File directly from RAM. But the program can only save one screenful in total, whether the computer is using 2K or 16K of RAM.

Using 16K of RAM should permit the storage of several screens if the contents of the Display File are dumped into a different string variable array each time a screen is finished. This process has a major disadvantage, since the poor old T/S1000 takes a long time (about 15 seconds even in FAST MODE) to dump the 726 byte Display File into a string array, and just as long a time to POKE the stored string characters back into the Display File in order to show a screen.

The following program illustrates the use of a string array for storing a screen and regenerating the screen from storage:

```
   10 REM **ZXDRAW** (T/S1000)
         BY KEN ABRAMSON

   20 REM THIS PROGRAM SHOWS HOW
 TO SAVE THE DISPLAY FILE IN A
 STRING ARRAY (LINES 400 TO 450)
 AND HOW TO POKE THE STRING
 CHARACTERS BACK INTO THE
 DISPLAY FILE OR SCREEN MEMORY
 (LINES 540 TO 590).

   30 LET D$=""
   40 LET S$="*"
   50 SLOW
   60 CLS
   70 PRINT ,,,,TAB 10;"ZXDRAW ME
NU",TAB 10;"■■■■■■■■■■■■■■■■■■■■",,,,TAB 2
;"1. NEW DRAWING",,,TAB 2;"2. CON
TINUE DRAWING",,,TAB 2;"3. COPY
 DRAWING ONTO SCREEN",,,TAB 2;"4.
  COPY DRAWING TO PRINTER",,,TAB
 2;"5. SAVE SCREEN TO TAPE"
   80 IF INKEY$="1" THEN GOTO 170
   90 LET C$=INKEY$
  100 IF INKEY$="2" THEN GOTO 530
  110 LET C$=INKEY$
  120 IF INKEY$="3" THEN GOTO 530
  130 LET C$=INKEY$
  140 IF INKEY$="4" THEN GOTO 530
  150 IF INKEY$="5" THEN GOTO 480
  160 GOTO 80
  170 CLS
  180 PRINT TAB 10;"CONTROL KEYS"
,TAB 10;"■■■■■■■■■■■■■■■■■■■■","5 -MOVES
  CURSOR LEFT",,,"6 -MOVES CURSOR
  DOWN",,,"7 -MOVES CURSOR UP",,,
"8 -MOVES CURSOR RIGHT",,,"0 -DR
AW (CURSOR NOT FLASHING)","  -ER
ASE (CURSOR FLASHING)",,,"C -CHA
NGE DRAWING CHARACTER",,,"M -MAI
N MENU",,"(SAVES SCREEN TO RAM F
IRST)",,,"S -SAVE SCREEN DIRECTL
Y TO TAPE"
  190 PRINT AT 21,0;"PRESS ENTER
TO BEGIN DRAWING"
  200 INPUT P$
  210 SLOW
  220 CLS
  230 LET Z=0
  240 LET X=15
  250 LET Y=10
  260 GOTO 280
  270 INPUT S$
  280 PRINT AT Y,X;S$;
  290 IF Z THEN PRINT AT Y,X;" ";
  300 IF INKEY$="5" AND X>0 THEN
 LET X=X-1
  310 IF INKEY$="8" AND X<31 THEN
  LET X=X+1
  320 IF INKEY$="6" AND Y<21 THEN
  LET Y=Y+1
  330 IF INKEY$="7" AND Y>0 THEN
 LET Y=Y-1
  340 IF INKEY$="0" THEN LET Z=NO
T Z
  350 IF INKEY$="C" THEN GOTO 270
  360 LET L$=INKEY$
  370 IF INKEY$="S" THEN GOTO 400
  380 IF INKEY$="M" THEN GOTO 400
  390 GOTO 280
  400 FAST
  410 DIM D$(726)
  420 LET D=PEEK 16396+256*PEEK 1
6397
  430 FOR F=1 TO 726
  440 LET D$(F)=CHR$ PEEK (D+F)
  450 NEXT F
  460 IF L$="S" THEN GOTO 500
  470 GOTO 50
  480 IF D$="" THEN GOTO 670
  490 CLS
  500 PRINT AT 21,0;"WHEN TAPE IS
  READY, PRESS ENTER"
  510 INPUT P$
  520 SAVE "ZXDRA■"
  530 IF D$="" THEN GOTO 670
  540 FAST
  550 CLS
  560 LET D=PEEK 16396+256*PEEK 1
6397
  570 FOR F=1 TO 726
  580 POKE D+F,CODE D$(F)
  590 NEXT F
  600 SLOW
  610 IF C$="3" THEN GOTO 720
  620 IF C$="4" THEN COPY
  630 IF C$="2" THEN GOTO 280
  640 FOR P=1 TO 150
  650 NEXT P
  660 GOTO 50
  670 CLS
  680 PRINT AT 10,7;"USE MENU CHO
ICE 1."
  690 FOR P=1 TO 30
  700 NEXT P
  710 GOTO 50
  720 PRINT AT 21,0;"PRESS ENTER
FOR MENU"
  730 INPUT P$
  740 GOTO 50
```

Line 410 sets aside 726 bytes in which to store the contents of the Display File (22 lines * 32 columns + 22 slots for ENTER characters needed at the end of each line).

Line 420 calculates the address of the beginning of the Display File.

Lines 430 to 450 store each byte of the Display File in correct order in the string array D$. Other drawings could be stored in other string arrays, e.g. A$, B$, C$, etc.

To get the drawing from the string array back to the screen, each byte must be POKED back into the Display File.

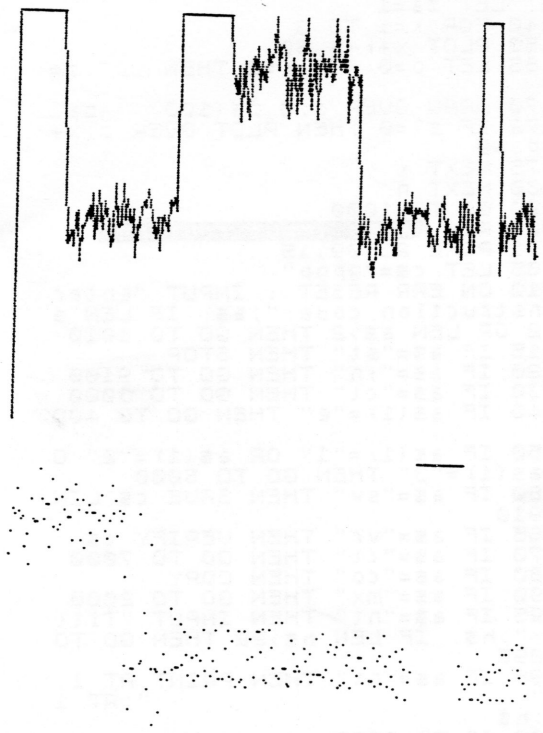
Line 560 again locates the address of the beginning of the Display File (which moves around).

Lines 570 to 590 POKE each byte from the string array, D$, into each successive address in the Display File. Again, by accessing stored information from other string arrays, other screens may be generated.

The above program may be expanded to store at least ten screens. You may like to try your hand at this yourself, or a ten screen version will soon be found in our software library for circulation. If you DO create some interesting graphics, please send them to the Newsletter. HAPPY DRAWING!!!

==========

```
 100 REM audioscan
 102 DEF FN a(l)=1+INT (.5+l/30)
 103 GO SUB 410
 105 GO TO 200
 110 DRAW INK FN a(l/1.5);x-n,IN
T (-l+y)/1.5: LET x=n: LET y=l:
RETURN
 120 DRAW INK FN a(l/1.5);0,-l/2
: RETURN
 200 PAPER 0: INK 7: BRIGHT 1: C
LS
 210 PRINT AT 0,10;"Audioscan"
 220 PRINT AT 2,2;"This program
gives a graphic    representatio
n of a signal    input to the 20
68 ear socket.."
 225 PRINT AT 7,2;"Load tape or
other signal    source to the ear
 socket and select option:"
 230 PRINT AT 12,5;"1--line grap
h";AT 13,5;"2--bar graph";AT 14,
5;"3--point graph"
 240 INPUT INVERSE 1;"enter opti
on (1 to 3)";q: IF q<1 OR q>3 TH
EN GO TO 240
 250 CLS : PRINT #1; INVERSE 1;"
space to freeze scan": LET i$=""
: LET x=0: LET y=0
 255 FOR n=0 TO 255: LET l=USR t
one: PLOT n,INT (l/1.5)
 260 IF q<3 THEN GO SUB 100+(q*1
0)
 265 LET i$=INKEY$: IF i$=" " TH
EN GO TO 300
 270 NEXT n
 275 GO TO 250
 300 PRINT #1; INVERSE 1;"m=menu
  r=restart  e=end": PAUSE 0
 310 LET i$=INKEY$: IF i$="m" TH
EN RUN
 320 IF i$="r" THEN GO TO 270
 330 IF i$="e" THEN STOP
 340 GO TO 300
 400 DATA 1,0,255,17,0,0,219,254
,203,119,32,1,19,16,247,66,75,20
1
 410 LET tone=65368
 420 FOR n=tone TO tone+17: READ
d: POKE n,d: NEXT n: RETURN
 425 STOP
 430 SAVE "audioscan": RUN
```



Make sure you try these two programs - they're well worth the effort.

I can't remember where I originally found this little gem so my apologies to the originator but it is such a great little graph program I had to share it.

```
  2 POKE 23609,15
  5 CLS : PRINT FLASH 1;"
    STOP TAPE!                "
 10 PRINT AT 12,0;" General Pu
rpose Graph Plotter "
 20 PAUSE 200: CLS : GO TO 9000
 60 FOR u=50 TO 150 STEP 10
 65 PLOT 56,u: DRAW 199,0
 70 NEXT u
 75 RETURN
100 REM plotting routine
105 LET f=CODE a$(2)-96
110 FOR n=1 TO 12
120 LET x=n*16: LET z=g(f,n)
130 LET za=0: IF z>m THEN LET z
=m: LET za=1
140 FOR k=1 TO 3
150 PLOT x+k+p,50
165 LET o=0: IF k=2 THEN LET o=
1
170 DRAW OVER o;0,z*(100/m)-za
172 IF z<=0 THEN PLOT OVER o;x+
k+p,49
175 NEXT k
180 NEXT n
190 GO TO 1000
1000 REM menu input routine
1001 POKE 23609,15
1005 LET c$="gpgp"
1010 ON ERR RESET : INPUT "enter
 instruction code:";a$: IF LEN a
$<2 OR LEN a$>2 THEN GO TO 1010
1015 IF a$="st" THEN STOP
1020 IF a$="in" THEN GO TO 9100
1030 IF a$="cl" THEN GO TO 3000
1040 IF a$(1)="e" THEN GO TO 400
0
1050 IF a$(1)="1" OR a$(1)="2" O
R a$(1)="3" THEN GO TO 5000
1060 IF a$="sv" THEN SAVE c$ LIN
E 910
1065 IF a$="vr" THEN VERIFY c$
1070 IF a$="fl" THEN GO TO 7000
1080 IF a$="co" THEN COPY
1090 IF a$="mx" THEN GO TO 2000
1095 IF a$="nt" THEN INPUT "Titl
e?:";h$: IF LEN h$>22 THEN GO TO
 1095
1096 IF a$="nt" THEN PRINT AT 1,
4;"                          ";AT 1
,8;h$
1100 GO TO 1000
2000 REM new max routine
2010 INPUT "Enter New Max Value"
,m
3000 REM Set Up New Screen
3010 CLS
3020 BORDER 6
3040 PRINT AT 1,6;h$
3050 GO SUB 8000
3080 PRINT AT 17,1;"Plot:";AT 18
,0;"1-";AT 19,0;"2-";AT 20,0;"3-
"
3090 PLOT 56,152
3100 DRAW 0,-102: DRAW 199,0
3110 GO SUB 60
3120 PRINT AT 16,7;l$;AT 17,7;m$
;AT 18,7;n$
3130 PRINT AT 3,2; BRIGHT 1;m
3140 PLOT 0,0: DRAW 255,0: DRAW
0,175: DRAW -255,0: DRAW 0,-175
3300 GO TO 1000
4000 REM Input Routine
4005 IF CODE a$(2)>108 OR CODE a
$(2)<97 THEN GO TO 1000
4007 LET st=1
4008 IF g$(CODE a$(2)-96)="
" THEN GO TO 4025
4010 IF g$(CODE a$(2)-96)<>"
" THEN INPUT "New file(Y)/Updat
e old(n):";t$: IF t$="y" THEN GO
 TO 4025
4012 LET st=1
4015 FOR w=1 TO 12
4018 IF g(CODE a$(2)-96,w)=-.1 T
HEN LET st=w: GO TO 4100
4020 NEXT w
4021 GO TO 4100
4025 INPUT "Enter file name(5cha
r):",g$(CODE a$(2)-96)
4030 PRINT AT 4+CODE a$(2)-96,2;
g$(CODE a$(2)-96)
4050 PLOT 56,152: DRAW 0,-102
4060 GO SUB 60
4070 FOR b=1 TO 12
4080 LET g(CODE a$(2)-96,b)=0
4090 NEXT b
4100 FOR a=st TO 12
4110 PRINT AT 20,9;"Data for Mon
th- ";a;" ?"
4120 INPUT g(CODE a$(2)-96,a)
4130 IF g(CODE a$(2)-96,a)=s THE
N GO TO 4150
4140 NEXT a
4150 PRINT AT 20,8;"
                    "
4200 GO TO 1000
5000 REM Set Up for plot routine
5010 IF CODE a$(2)<97 OR CODE a$
(2)>108 THEN GO TO 1000
5030 FOR y=1 TO 12
5040 IF g(CODE a$(2)-96,y)<>0 TH
EN GO TO 5100
5050 NEXT y
5060 PRINT AT 20,9;"No file at:"
;CHR$ (CODE a$(2)-32): PAUSE 100
: PRINT AT 20,9;"                ";
 GO TO 1000
5100 IF a$(1)="1" THEN LET p=p1
5110 IF a$(1)="2" THEN LET p=p2
5120 IF a$(1)="3" THEN LET p=p3
5150 LET t=(CODE a$-48)
5200 PRINT AT 17+t,2;g$(CODE a$(
2)-96)
5300 GO TO 100
7000 REM File value on screen
7005 LET c=5
7010 CLS : PRINT AT 0,10; BRIGHT
 1;" File Values "
7020 FOR e=17 TO 20
7025 PRINT AT e,3;CHR$ (48+e);"-
";g$(e-16)
7030 PRINT AT e,12;CHR$ (52+e);"
-";g$(e-12)
7040 PRINT AT e,21;CHR$ (56+e);"
-";g$(e-8)
```

```
7050 NEXT e
7060 PLOT 0,52: DRAW 255,0
7070 GO SUB 8300
7075 PRINT AT 0,10; BRIGHT 1;" F
ile Values "
7080 FOR d=1 TO 12
7085 LET v=d*2
7090 PRINT AT 2+d,1;l$(v)
7100 PRINT AT 2+d,2;m$(v)
7110 PRINT AT 2+d,3;n$(v);"-"
7140 NEXT d
7150 PRINT AT 16,12; BRIGHT 1;"
Files: "
7160 PLOT 0,164: DRAW 255,0
7200 IF c>=29 THEN GO TO 7000
7205 INPUT "Enter file (A-L):";o
$: IF CODE o$<97 OR CODE o$>108
THEN GO TO 7205
7220 PRINT AT 2,c;CHR$ (CODE o$-
32);"-";g$(CODE o$-96)
7250 FOR q=1 TO 12
7255 IF g(CODE o$-96,q)=s THEN P
RINT AT q+2,c;"0": GO TO 7270
7260 PRINT AT q+2,c;g(CODE o$-96
,q)
7270 NEXT q
7280 LET c=c+9
7290 PLOT 255,0: DRAW 0,175
7300 INPUT "(f)-File;(c)-Copy;(p
)-plot;";r$
7305 IF r$="s" THEN STOP
7310 IF r$="f" THEN GO TO 7200
7320 IF r$="c" THEN COPY
7330 IF r$="P" THEN GO TO 3000
7340 IF r$="in" THEN GO TO 9100
7350 GO TO 7300
8040 PRINT AT 4,1;"Files."
8060 FOR n=5 TO 16
8080 PRINT AT n,0;CHR$ (60+n);"-
";AT n,2;g$(n-4)
8100 NEXT n
8200 RETURN
8300 PLOT 0,0: DRAW 255,0: DRAW
0,175: DRAW -255,0: DRAW 0,-175:
 RETURN
9000 REM Initialize Routine
9010 DIM g(12,12)
9015 DIM g$(12,5)
9020 LET p1=44: LET p2=49: LET p
3=53: LET m=100
9030 LET l$=" J F M A M J J A S
O N D"
9040 LET m$=" a e a p a u u g e
c o e "
9050 LET n$=" n b r l y n l t p
t v c"
9060 LET c$="gpgp"
9070 LET h$="Enter your title."
9080 LET s=-.1
9100 CLS
9110 PRINT FLASH 1;"          Instr
uction Codes:          "
9140 PRINT "Enter ""e(a-l)"" TO
load a file."
9150 PRINT '"Enter ""1-3(a-l)""
to plot a file."
9155 PRINT "(1-3) is the positio
n ploted."
9160 PRINT '"Enter ""nt"" for a
new name."
9170 PRINT '"Enter ""fl"" to get
 file values."
9180 PRINT '"Enter ""mx"" to get
 new max value."
9185 PRINT "This will erase any
old plots."
9190 PRINT '"Enter ""sv"" to sav
e on tape."
9195 PRINT "This will save GPGP
with Files."
9200 PRINT '"Enter ""cl"" to cle
ar plots."
9210 PRINT '"Enter ""in"" to see
 instructions."
9215 PRINT '"Enter ""co"" to cop
y on paper."
9220 PRINT FLASH 1;"    Press EN
TER to continue.    "
9250 PAUSE 0
9260 IF INKEY$="c" THEN COPY
9300 GO TO 3000
```

<<<<<<<<<<<<<<<<<<<<<<<<<<

```
  10 SAVE "LOAN"
  15 POKE 16513,234
  20 PRINT "AMOUNT OF LOAN?"
  30 INPUT A
  40 PRINT A
  50 PRINT "ANNUAL INTEREST RATE
?"
  60 INPUT R
  70 PRINT R
  80 PRINT "LOAN DURATION IN MON
THS?"
  90 INPUT M
 100 PRINT M
 110 LET Z=(R/100)/12
 120 LET D=(1+Z)**M
 130 LET D=1-(1/D)
 140 LET P=A*(Z/D)
 150 LET P=.01*INT (P*100+1)
 160 PRINT "PAYMENT=";P
 170 PRINT
 200 SCROLL
 210 FOR I=1 TO M
 220 SCROLL
 225 PRINT AT 0,0;"NO. INTERST
 PRINCIPAL  BALANCE"
 230 LET Y=A*Z
 240 LET Y=INT (Y*100+.5)/100
 250 LET R=P-Y
 260 IF R>A THEN LET R=A
 270 LET A=INT (.5+100*(A-R))/10
0
 280 PRINT AT 21,8;".00";TAB 18;
".00";TAB 29;".00"
 290 PRINT AT 21,0;I;TAB (4+(Y<1
E3)+(Y<100)+(Y<10));Y;TAB (14+(R
<1E3)+(R<100)+(R<10));R;TAB (22+
(A<1E6)+(A<1E5)+(A<1E4)+(A<1E3)+
(A<100)+(A<10));A
 300 NEXT I
```

Reprinted from "THE DATA EXPANSION"
June 1986 - The newsletter of the
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HOW ABOUT THAT
By Gene Pickens

'If the aircraft industry had evolved as spectacularly as the computer industry over the past 25 years, a Boeing 767 would cost $500 today, and it would circle the globe in 20 minutes on 5 gallons of fuel. Such performance would represent a rough analogue of the reduction in cost, the increase in speed of operation and the degree in energy consumption of computers. The cost of computer logic devices is falling at the rate of 25 percent per year and the cost of computer memory at the rate of 40 percent per year. Computational speed has increased by a factor of 200 in 25 years. In the same period the cost, the energy consumption and the size of computers of comparable power have decreased by a factor of 10,000.

The result is the advent of the personal computer, which for less than $500 can put at the disposal of an individual about the same basic computing power as a mainframe computer did in the early 1960's and as a minicomputer did in the early 1970's. Twenty years ago the cost of a computer could be justified only if the machine met the needs of a large organization. The minicomputer introduced in the 1970's are appropriate for a department or working group in such an organization. Moreover, just as it has become financially feasible to provide a computer for the individual worker, so also the technical developments have made the interface between man and machine increasingly 'friendly,' so that a wide array of computer functions are now accessible to people with no technical background.

The first personal computer was put on the market in 1975. By the end of this year (1982). . . . etc.'

The above is a direct quote from the opening of the article 'Personal Computers' by Toong and Gupta in SCIENTIFIC AMERICAN for December, 1982. As much or more has happened in the computer industry in the past 3 1/2 years. You might not want a Boeing 767 even if you could get one for $500, but the next time you sit down at your 'toy' TIMEX 1000 or 2068, pause and reflect for a moment about the machine and what you can do with it. Also, remember that you bought a very good computer for much less than $500.

TIMEX computers fit my definition of value --MORE FOR LESS=VALUE-- very well. Maybe the people that, in their ignorance, call TIMEX computers 'toys' are just trying not to be reminded of the old proverb; 'A fool and his money are soon parted.' Just think, we all could have spent more money for each BASIC Keyword, we could have spent more money for a card to have color and so on, and so on.

Well, believe it or not I really an not out to knock other people's computers. I just get tired of reading and hearing people make remarks, about mine or some other computer, that show the same mentality and maturity as a first grader saying 'My daddy can whip your daddy.' My TIMEX fits me just fine, thank you, and I have learned many things at a very economical price. HOW ABOUT THAT?

[I feel the urge to toss in my 'two cents'. I always feel proud of the fact that I own and use, really 'USE' a TIMEX 2068. Granted, with more money I would surpass the $500 mark to have the dual disk drives, 80 column printer, modem and such, but it still would be, for the most part, under what one of the other computers is priced. Besides-I'm comfortable with my machine! ED]

****

The following article will shortly appear in SYNCWARE NEWS

ONE-CHIP MODS

BUILT-IN NVM

By Gerd Breunung & Fred Nachbaur

[EDITOR'S NOTE: We have received several submissions for non-volatile memories based on the 6264-LP 8K static RAM. Though all have their merit, this one is the most elegant. It is fully decoded, yet still requires only one IC (the 6264-LP SRAM). Furthermore, it is installed on the ZX81/TS1000 board itself, and therefore does not require edge connectors, etc. Lastly, all parts except the RAM chip are available at your nearby Radio Shack. Some sources of the 6264-LP are Microprocessors Unlimited, Active Electronics, and Jameco. Check the ads in "Byte" and "Computer Shopper" for other sources.]

This battery backed-up RAM is a miniaturization and functional equivalent of the famous "Hunter" board. It was designed by Mr. Wilf Rigter of the Vancouver, BC T/S User Group. I owe many thanks to Mr. Rigter for inspiring me to write this article, and assisting with technical advise during the construction and refinement of this project. Yes, everything in this article has been built and tested.

This non-volatile RAM resides in the 8-16K space of the ZX/TS memory map, and is fully decoded. Now you can run utilities like Q-Save, Toolkits, Mini-Xmodem, and many others, without loading from tape each time. Furthermore, it is compatible with Mr. Rigter's (The ZED Group) bit-mapped HI-RES.

CONSTRUCTION

You do not have to be a technical wizard to implement this project. No trace cuts are required on the computer board. We will build a small sub-assembly which plugs into the original 24-pin 2K RAM socket. Seven wire leads are then soldered to the computer board, and a battery holder is mounted using double-sided adhesive foam. Two additional wires connect to the battery.

If your particular computer has the 2K RAM soldered in, your best option is to scout around for another board with a socketed 2K RAM chip. Alternately, clip out the 2K chip with small, sharp wire cutters. Then remove the "legs" with needle-nose pliers and a soldering iron. Finally, use a suction-type solder remover to clean out the holes, and install a 24-pin socket.

If you have the original ZX81 with two 1K chips soldered in, you can simply leave them in. Solder a 24-pin socket into the space marked on the board for it. You will have to cut the centre support "strut" to clear the 1K chip that lives in the centre of the 24-pin socket pattern.

Obtain an "Experimenter Board" from Radio Shack, and cut out a 1"X3.2" piece as shown in Figure 1. Note that Fig. 1 is the view from the circuit (trace) side. Insert a low-profile 28-pin wire-wrap socket as shown, letting the leads protrude 3/16" on the trace side. Solder the lower 24 pins (only) to the board. These will be the "legs" that plug into the 24-pin socket on the computer, so be careful to keep the pins free of excess solder.

Now use SMALL and SHARP wire cutters to cut the 24 soldered pins on the "component" side, and set the socket aside. Then cut four traces between the socket and the male legs, as shown in Fig. 1, at pin numbers 20, 22, 23 and 26 of the 28-pin socket. (Note that the numbers apply to the 28-pin socket that will later be re-installed.)

Next we'll install the components and jumpers as indicated in Figure 2a.

Install jumpers, components and "flying leads," referring to Fig. 2a, and the schematic of Fig. 3. To make final assembly easier, you might want to colour-code the flying leads. Individual strands of coloured ribbon cable are one possible source of small-gauge coloured wire. Note that diode D1 should preferably be a Schottky or Germanium type; silicon (1N4148) works on my unit, but might have too much forward drop to give reliable battery back-up with some chips.

Now insert the just-freed 28-pin socket into the board; note that the socket is offset from the "legs" by two holes. (See Fig. 2b.) Solder all 28 pins, and cut off the excess lengths.

If you wish to install a write-protect switch, connect flying leads to the points shown. When this line is open, the board will be write-protected. If you don't want this feature, replace this line with a jumper. Check your work, and double-check it. Now check it again. Be alert for shorts, "cold" (dull-looking) solder joints, and backwards diodes.

FINAL WIRING

Before we get on with the installation, a warning is in order. If you have moved your computer to a larger case, with plenty of headroom over the 2K socket, then you have nothing to worry about. However, if your machine is still in the stock case, then the installation of this addition would kink and thereby break the traces on the larger keyboard "tail." More headroom is required over the new installation to allow for the already minimal bend radius in the ribbon cable. Install spacers, 1/2" long, between the component side of the board and the case top. Ideally, a grounded metal skirt should be installed around the resulting perimeter gap, to contain RFI and keep out dust. You might find another solution, such as shortening the cable slightly and/or taping it to curve the other way.

Plug your newly-built module into the 24-pin 2K RAM socket. Connect the seven flying leads to the ZX81 board. The best place to pick up the address lines A11 through A15 is at the cathode (banded) ends of the keyboard diodes. See Figure 2c. The diodes are number D1 through D8, starting at the end closest to the ROM chip. "A11" goes to D1, "A12" to D3, "A13" to D5, "A14" to D7, and "A15" to D8. Be careful about shorts, as there isn't much clearance between the diode leads. Pick up MREQ NOT at the plated-through hole near (and connecting to) edge connector pin 14, component side. (Remember, the keyslot is "pin 3.") Pick up ROMCS NOT' at the plated-through hole near (connecting to) pin 23 on the solder side. Finally, use "sticky foam" to mount the battery holder at a convenient point in the case, and connect the battery wires. Check everything over one last time. Fix anything that looks at all suspicious. You're done!

TESTING

If you have a ZX81 and left in the two 1K RAM chips, you can test your system without a RAM pack. Otherwise, you will of course need to connect your external RAM pack in order to operate your system, since the built-in 2K RAM is no longer available.

A preliminary test can be done by entering POKE 10000,123. Then PRINT PEEK 10000. You should get the same number back. Try POKEing different locations between 8192 and 16383; in each case, you should get back the same number you POKEd.

So far so good? Great. Now let's do a more complete test. Since the CMOS RAM board is used in the 8-16K region, a special procedure is required to test the memory. This is because the memory in this block is not regarded by the ZX operating system as being available. So we have to use a program to do a complete test on this memory space. To save time, we'll use a machine-code routine to do this.

Enter the following short BASIC program, which will make it easy to enter the machine-code test routine:

```
MACHINE-CODE LOADER FOR TEST

  1 REM 123456789012345678901234
5678901234567890123
 10 FOR A=16514 TO 16556
 20 SCROLL
 30 INPUT N
 40 POKE A,N
 50 PRINT PEEK A
 60 NEXT A
```

Enter RUN, and input the values from the following table, going from left to right, top to bottom. If you make a mistake, enter STOP, then LET A=A-1, then GOTO 20, and re-input the correct number.

```
TEST ROUTINE: DECIMAL VALUES

175 245 241  61  40  33  33 255
 31 245  35 124 254  64  40   4
241 119  24 245  33 255  31  35
124 254  64  40 229 241 190  32
  3 245  24 243  68  77 201   1
  0   0 201
```

This installs a machine-language routine (by Fred Nachbaur), which tests every memory location from 8192 to 16383, with every possible value from 0 to 255. (A total of 2,097,152 writes and reads!) The disassembly is shown below.

```
4082 AF          TEST XOR A
4083 F5              PUSH AF
4084 F1          NXVL POP AF
4085 3D              DEC A
4086 2821            JR Z OKAY
4088 21FF1F      WRIT LD HL,1FFF
408B F5          NWAD PUSH AF
408C 23              INC HL
408D 7C              LD A,H
408E FE40            CP 40
4090 2804            JR Z READ
4092 F1              POP AF
4093 77              LD (HL),A
4094 18F5            JR NWAD
4096 21FF1F      READ LD HL,1FFF
4099 23          NRAD INC HL
409A 7C              LD A,H
409B FE40            CP 40
409D 28E5            JR Z NXVL
409F F1              POP AF
40A0 BE              CP (HL)
40A1 2003            JR NZ NOGD
40A3 F5              PUSH AF
40A4 18F3            JR NRAD
40A6 44          NOGD LD B,H
40A7 4D              LD C,L
40A8 C9              RET
40A9 010000      OKAY LD BC,0000
40AC C9              RET
```

Enter FAST mode, then enter PRINT USR 16514. If all is well, the routine will take about 90 seconds to run. It would take about ten minutes in SLOW mode. (Don't even ask how long it would take if it were written in BASIC!) If the screen returns with 0, all is well. If there is a defective location, its address will be printed instead.

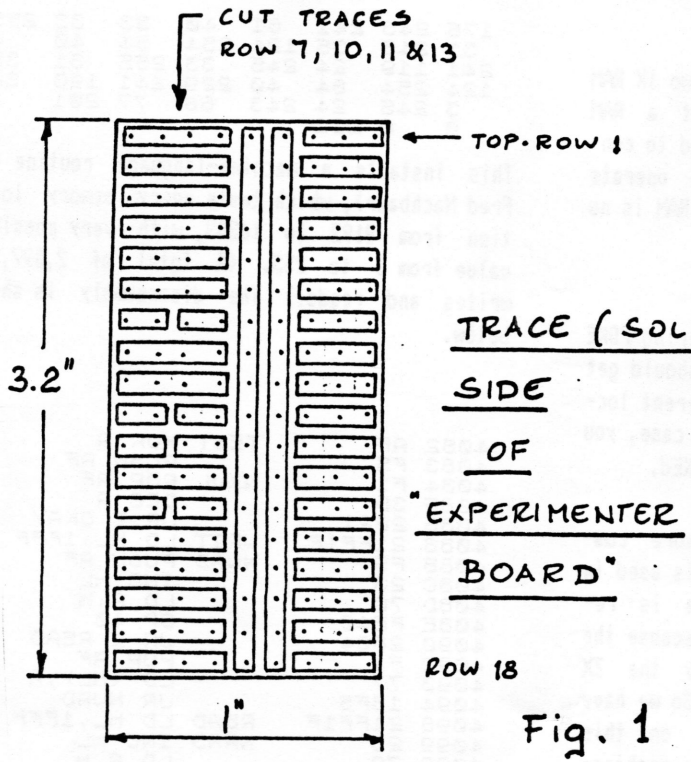


Fig. 1

Shopping List

"Experimenter Board"

U1 - HM 6264 LP-15 (HITACHI OR EQUAL)
8K x 8 S RAM

R1 - 1KΩ 1/8 W Carbon Film Resistor

R2 - 1MΩ 1/8 W Carbon Film Resistor

D1 - Schottky or Germanium type
Signal Diode

D2-D5 - IN 4148 Diodes

Q1 - 2N 3904 NPN Transistor

B1 - 3 Volt Battery System: 2 "AAA" ALKALINE
CELLS COMPLET WITH HOLDER AND DOUBLE SIDED
FOAM TAPE

A wealth of software exists for memory in the 8-16K region. Included are many types of toolkits, compilers, assemblers, and other utilities.

I highly recommend that you obtain copies of the July and August, 1983 issues of Radio-Electronics magazine from your local library. These issues contain many useful software routines by Dr. Paul Hunter, creator of the original "Hunter" board. Included are utilities to save and recall BASIC and machine-code programs, screen displays, and other data. Also check previous issues of SyncWare News, as well as back-issues of other magazines for software that will run in your new non-volatile memory.

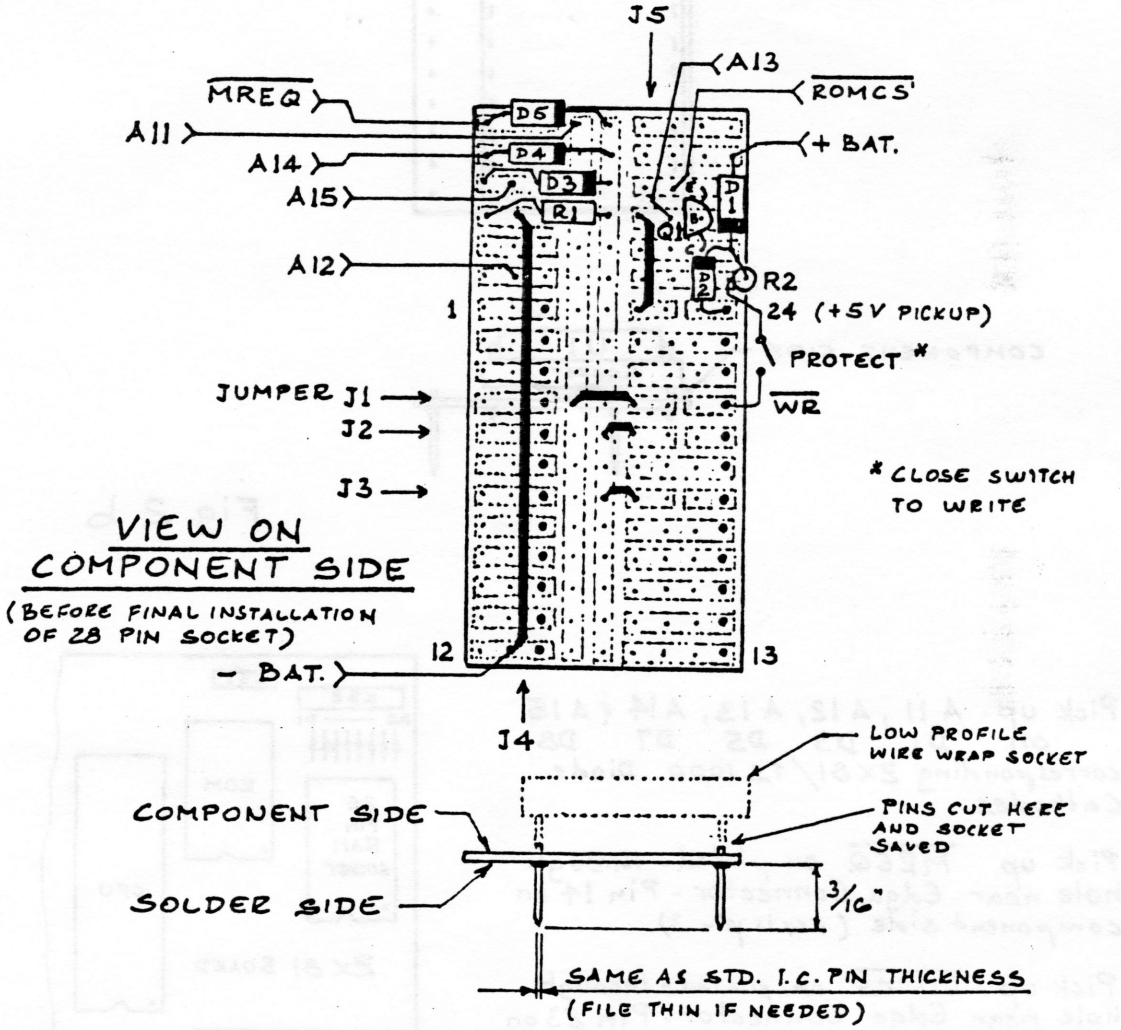
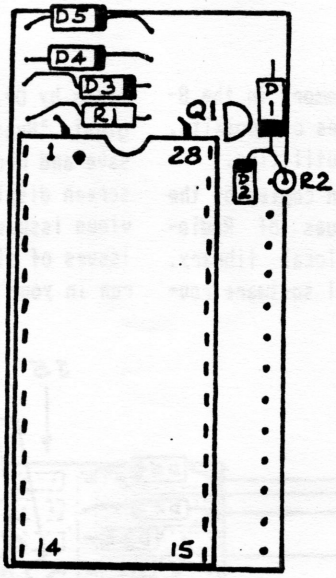


Fig. 2 a

VIEW ON COMPONENT SIDE

(INSTALLATION OF 28 PIN SOCKET AND U1



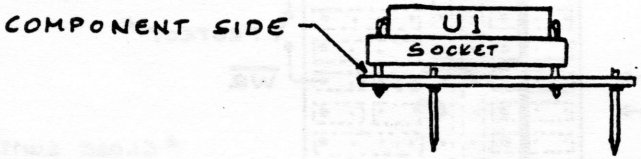


Fig. 2 b

- Pick up A11, A12, A13, A14 & A15 on D1 D3 D5 D7 D8 corresponding ZX81/TS1000 Diode Cathodes.
- Pick up $\overline{\text{MREQ}}$ on plated-through hole near Edge Connector - Pin 14 on component side (Key is pin 3)
- Pick up $\overline{\text{ROMCS}}$ on plated-through hole near Edge Connector - Pin 23 on solder side.

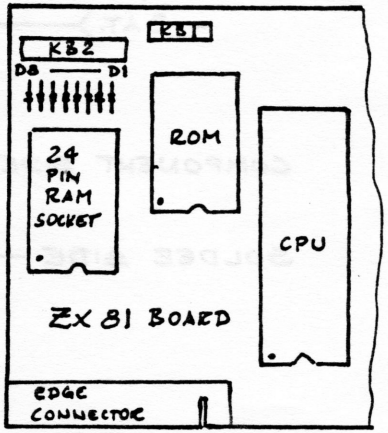
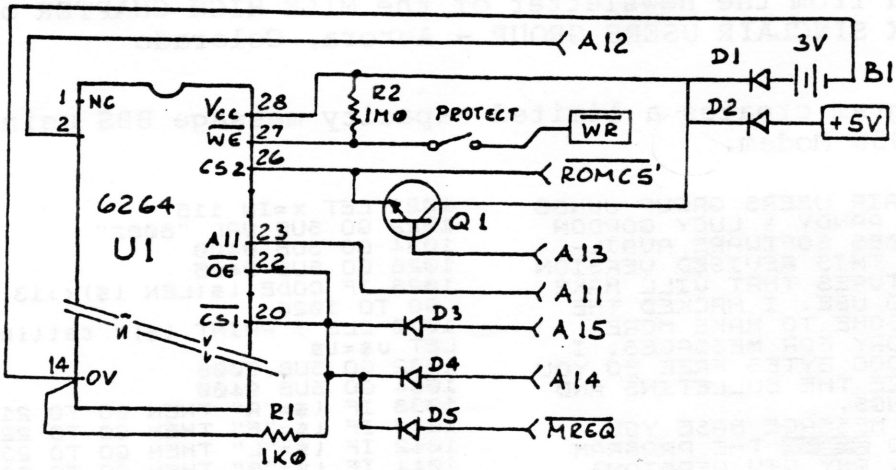


Fig. 2 c



SCHEMATIC

Fig. 3

##

DUNGEON OF YMIR

A MULTI-LEVEL MAZE ADVENTURE GAME by Fred Nachbaur (C)1986

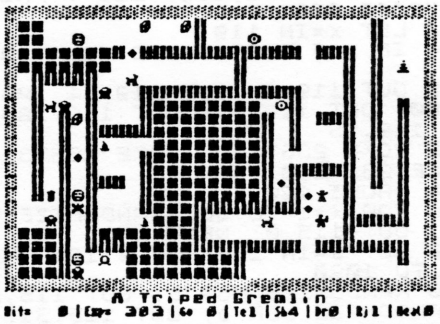
FOR THE TIMEX TS1500

FINALLY! A FULL-FEATURE, HIGH RESOLUTION DUNGEON GAME FOR THE TS1500!

This 24K game, written entirely in machine-code, is the most spectacular program ever written for the TS1500. Nine levels, 16 types of monsters, 14 objects, six spells. Easy to play, difficult to master. Includes FAST-SAVE with auto-boot to save in-progress games: time to load entire program reduced to 70 seconds! Revolutionary TRUE HI-RES puts your TS1500 on a par with much larger machines.

Send $24.95 (cheque or MO) to FRED NACHBAUR, C-12 MTN. STN. GROUP BOX, NELSON BC V1L 5P1 CANADA. Specify version: V1 (TS1500 + 8K Hunter NVM or equivalent) or V2 (TS1500 + 16K RAM pack). V2 requires a minor hardware addition (included). COMING SOON: V3 for ZX81/TS1000. Inquire. *** ALSO AVAILABLE: TS1500 HI*RES EXTENDED BASIC ($16.95)

ALL ARTWORK IN THIS AD FROM ACTUAL SCREEN DUMPS!



Reprinted from the newsletter of the MILE HIGH CHAPTER of the TIMEX SINCLAIR USERS GROUP - Aurora, Colorado

This program creates a limited capacity message BBS using a 2068 & 2050 Modem.

```
TIMEX SINCLAIR USERS GROUP JUN86
  THANKS TO RANDY & LUCY GORDON
FOR MAKING BBS SOFTWARE AVAIL-
ABLE TO US. THIS REVISED VERSION
HAS NEW FEATURES THAT WILL MAKE
IT EASIER TO USE. I HACKED THE
BASIC DOWN SOME TO MAKE MORE
ROOM IN MEMORY FOR MESSAGES. I
LEFT OVER 5000 BYTES FREE SO YOU
CAN CUSTOMIZE THE BULLETINS AND
PROMPT STRINGS.
TO SAVE THE MESSAGE BASE YOU
WILL HAVE TO [redacted] THE PROGRAM
& [redacted] 9950. ANY NEW VERSIONS
WILL BE SOLD BY ME FOR $5.00.
I CAN ONLY SEND LISTINGS FOR
THAT PRICE.
PHILLIP BASFORD
1554 BOSTON ST
AURORA CO 80010-1902


  10 PAPER 0: INK 7: BORDER 1: C
LS
  12 PRINT "stop tape"''''"then p
ress (ENTER)": PAUSE 0: CLEAR 65
478
  14 LET l$="175219119230003079O
060002012191192301282001752191l9
230002040244219115050199255079211
9119230128200175219119230001040244201"
  16 FOR x=0 TO 55: POKE 65480+x
,VAL l$(3*x+1 TO 3*x+3): NEXT x
  18 LET o=VAL "65523": LET i=VA
L "65489": LET l=VAL "9100": LET
 aa=VAL "1000": LET q=VAL "9200"
  20 DIM m$(90,300): DIM y(1): P
RINT "load?": PAUSE 0: IF INKEY$
<>"y" THEN GO TO 24
  22 LOAD "" DATA m$(): LOAD ""
DATA y(): LET y1=y(1)
  23 GO TO 25
  24 LET y1=0
1000 OUT 119,34: OUT 119,0
1001 POKE 23692,255: CLS : PRINT
 """2068 BBS"""
1002 LET x=IN 119
1004 IF x=5 THEN GO TO VAL "1002
"
1010 OUT 119,2: OUT 119,34: PAUS
E 300: OUT 119,64: OUT 119,123:
OUT 119,55
1012 POKE 23674,0: POKE 23673,0:
 POKE 23672,0
1014 PAUSE 120
1016 FOR x=1 TO 30: RANDOMIZE US
R o: OUT 115,0: NEXT x
1018 LET a=IN 119: IF a<128 THEN
 GO TO 1020
1020 RANDOMIZE USR o: OUT 115,28
: RANDOMIZE USR o: OUT 115,31: R
ANDOMIZE USR o: OUT 115,28
1021 LET x=IN 115
1022 GO SUB VAL "8002"
1024 GO SUB 9400
1026 GO SUB 9405
1028 IF CODE l$(LEN l$)<>13 THEN
 GO TO 1026
1030 CLS : PRINT l$;" calling":
LET u$=l$
1032 GO SUB 8006
1034 GO SUB 9400
1038 IF l$="R" THEN GO TO 2100
1040 IF l$="F" THEN GO TO 2200
1042 IF l$="L" THEN GO TO 2300
1044 IF l$="B" THEN GO TO 9200
1046 IF l$="#" THEN GO TO 2400
1048 IF l$="C" THEN GO TO 2500
1090 GO TO 1032
2100 REM Reverse Read
2104 FOR b=y1 TO 1 STEP -1
2105 GO SUB 8018
2106 GO SUB 9500
2114 IF l$="N" THEN NEXT b
2116 IF l$="M" THEN GO TO 1032
2118 GO TO 1032
2200 REM Forward Read
2204 FOR b=1 TO y1
2205 GO SUB 8018
2206 GO SUB 9500
2214 IF l$="N" THEN NEXT b
2216 IF l$="M" THEN GO TO 1032
2218 GO TO 1032
2300 REM  Leave Message
2302 LET y1=y1+1: IF y1=90 THEN
LET y1=1
2304 GO SUB 8010
2306 GO SUB 9400
2308 GO SUB 9405
2310 IF in<>13 THEN GO TO 2308
2312 LET l$="TO: "+l$+CHR$ 13+"F
ROM: "+u$+CHR$ 13: LET y2=LEN l$
: LET m$(y1, TO y2)=l$
2314 GO SUB 8012
2316 GO SUB 9400
2318 GO SUB 9402
2320 IF in<>13 THEN GO TO 2318
2322 REM  Wordwrap
2330 IF LEN l$>299-y2+1 THEN LET
 l$=l$( TO 299-y2)
2332 LET c1=33
2334 IF l$(c1)<>" " THEN LET c1=
c1-1
2336 IF l$(c1)=" " THEN LET l$(c
1)=CHR$ 13
2338 IF CODE l$(c1)<>13 THEN GO
TO 2334
2340 LET m$(y1,y2+1 TO y2+c1)=l$
( TO c1): LET y2=y2+c1
2342 LET l$=l$(c1+1 TO )
2344 IF LEN l$>32 THEN GO TO 233
2
2345 LET l$=l$+CHR$ 7
2346 LET m$(y1,y2+1 TO 300)=l$
2350 GO TO 1032
2400 REM  Read by Number
```

```
2401 GO SUB VAL "8016"
2402 GO SUB 9400
2404 GO SUB 9405
2406 IF in<>13 THEN GO TO 2404
2408 LET b=VAL l$( TO (LEN l$-1)
)
2410 GO SUB 8018
2412 GO SUB 9500
2414 IF l$="N" THEN GO TO VAL "2
400"
2416 IF l$="M" THEN GO TO VAL "1
032"
2418 GO TO 1032
2500 REM  Chat Mode
2502 GO SUB 8020
2504 FOR x=1 TO 128
2506 BEEP .1,10+INT (x/10)
2508 RANDOMIZE USR o
2510 OUT 115,46
2512 IF INKEY$<>"" THEN GO TO 25
50
2514 NEXT x
2516 GO SUB 8022: GO TO 1032
2550 CLS : PRINT "chat w/";u$
2552 GO SUB 8024
2554 PRINT "NOT to escape"
2556 IF CODE INKEY$=195 THEN GO
TO 1032
2558 POKE 23692,255
2560 LET r=0: LET xmit=0
2562 LET a=USR 65480
2564 LET xmit=1 AND (a=1 OR 1=3)
2565 LET r=1 AND (a=2 OR a=3)
2569 IF r THEN GO TO 2576
2572 GO TO 2588
2576 RANDOMIZE USR i: LET in=PEE
K 65479: IF in>31 OR in<123 THEN
 PRINT CHR$ in;: IF in=13 THEN P
RINT ">": GO TO 2556
2588 IF xmit AND INKEY$<>"" THEN
 GO SUB 2592
2590 GO TO 2556
2592 IF xmit THEN LET l$=INKEY$:
 PRINT l$;: OUT 115,CODE l$: FOR
 x=1 TO 5: NEXT x: IF CODE l$=13
 THEN PRINT ">";
2596 RETURN
8000 REM  Strings Going Out
8002 LET p$=CHR$ 12+"TIMEX BOARD
"+CHR$ 13+"TURN YOUR CR SUPPRESS
OR OFF"+CHR$ 13+CHR$ 13+"YOUR NA
ME?"+CHR$ 13+">"+CHR$ 7: GO SUB
 l: RETURN
8006 GO SUB VAL "9900": LET p$=C
HR$ VAL "12"+"(B)YE BYE"+CHR$ 13
+"(L)EAVE MSG."+CHR$ 13+"(F)WD.
READ"+CHR$ 13+"(R)EV. READ"+CHR$
 13+"(#) READ BY #"+CHR$ 13+"(C)
HAT"+CHR$ 13+"TIME ON "+l$+CHR$
13: GO SUB l: RETURN
8008 LET p$=CHR$ 12+"      BYE-BY
E": GO SUB l: RETURN
8010 LET p$=CHR$ VAL "12"+"WHO G
ETS MESSAGE?"+CHR$ 13: GO SUB l:
 RETURN
8012 LET p$=CHR$ 12+"250 CHARACT
ERS MAX"+CHR$ 13+"(ENTER) SAVES
MESSAGE"+CHR$ 13: GO SUB l: RETU
RN
8014 LET p$=CHR$ 13+"(N)EXT MESS
AGE OR (M)ENU"+CHR$ 13: GO SUB l
: RETURN
8016 LET p$=CHR$ 13+"INPUT MESSA
GE # "+CHR$ 13+"[1-90] ->": GO S
UB l: RETURN
8018 LET p$=CHR$ 13+"MESSAGE # "
+STR$ B+CHR$ 13: GO SUB l: RETUR
N
8020 LET p$=CHR$ 12+"PAGING SYSO
P.....": GO SUB l: RETURN
8022 LET p$="HE'S NOT HERE!!": G
O SUB l: RETURN
8024 LET p$="OK, LET'S TALK...":
 GO SUB l: RETURN
9000 CLEAR : SAVE "BBS" LINE 10:
 STOP
9100 FOR x=1 TO LEN p$: RANDOMIZ
E USR o: OUT 115,CODE p$(x): NEX
T x: POKE 23692,255: PRINT p$: R
ETURN
9201 GO SUB 8008: ON ERR RESET :
 RANDOMIZE USR o: OUT 115,28: RA
NDOMIZE USR o: OUT 115,31: GO SU
B l: OUT 119,64: OUT 119,0: OUT
119,0
9202 BEEP .2,10: BEEP .3,-20
9204 GO TO aa
9400 LET l$=""
9406 ON ERR GO TO q: RANDOMIZE U
SR i: LET in=PEEK 65479
9407 IF in=13 THEN GO TO 9409
9408 IF in<32 OR in>122 THEN GO
TO 9406
9409 POKE 23692,255: PRINT CHR$
in;
9410 LET ca=in: IF in>96 AND in<
123 THEN LET ca=in-32: LET in=ca
9412 LET l$=l$+CHR$ in
9414 RETURN
9500 LET l$=m$(b)
9504 FOR a=300 TO 1 STEP -1: IF
CODE l$(a)<>7 THEN NEXT a
9506 LET p$=l$( TO a)
9510 GO SUB l: GO SUB 8014: GO S
UB 9400: RETURN
9900 LET l$="": LET t=PEEK 23672
+2↑8*PEEK 23673+2↑16*PEEK 23674:
 LET m=INT (t/3600): LET s=INT (
(t/3600-m)*60): LET l$=STR$ m+":
"+("0" AND s<10)+STR$ s: RETURN
9950 SAVE "Msgs" DATA m$(): LET
y(1)=y1: BEEP .1,50: SAVE "count
" DATA y(): STOP
```

```
:==============================
#
#    10 OUT 119,34
#    20 OUT 119,0
#    30 LET x=IN 119
#    40 IF x=5 THEN GO TO 30
#    50 FOR a=1 TO 10: FOR b=25 TO
# 45: BEEP .05,b: NEXT b: NEXT a
#
# this routine uses your computer
# and modem to ring the phone bell
# in an unusual way. with an
# amplifier hooked up to your
# cassette MIC jack on the back
# of the 2068 you can make an
# extra loud bell for your phone
# to use if you are working in the
# yard or getting a wake-up call.
# try other BEEP routines until
# you get one that you can hear
  from far away.
```

Adding a Full Size Printer to Your System

Reprinted from S.U.M. May/86

Today, dot matrix printers are available from many sources at very reasonable prices. Many TS1000/1500 users are still using the TS2040 as their only printer. Now may be the time to upgrade. Let's consider some of the possibilities.

First, there is a product now available for those who already have a dot matrix printer, in particular the Gorilla Banana or Seikosha 100. There is now a simple chip plug-in available that can give a considerably better looking printout on these printers by giving characters such as "y" and "g" true descenders. For those who love their printers and are willing to spend $14.95 to upgrade them, contact RMG Enterprises, 1419 1/2 7th Street, Oregon City, OR 97045.

Of course, those who fit the bill of the paragraph above must have a "printer interface" which allows them to use a full size printer. This is the first requirement to adding a printer. Because the TS1000/ZX81 and family use non-standard codes to represent characters, interfaces generally cost more than on the TS2068 in order to translate these codes into something the printer understands.

Interfaces that have been available for some time include the Aerco Centronics and Aerco RS-232C Serial (at $99 each) and the Byte-Back Centronics ($89.95) and RS-232 Serial ($69.95). Generally, printers with centronics parallel interfaces are less expensive and so would dictate choosing this type interface. The above interfaces are available from their manufacturers as well as RMG Enterprises, Sunset Electronics, and other TS dealers.

Another of the original TS interface manufacturers was Memotech which manufactured both types of interfaces as well. Word from several sources is that Memotech products are once again available from Oxford Data. These were excellent interfaces and well worth considering.

Do you have a TS2068 and printer interface? GOOD NEWS! You can now use that 2068 printer interface on your TS1000/ZX81 as well! What's the catch? Only that you will have to buy a software utility called the "Universal Printer Driver" to use them. It is available from Fred Nachbaur ($16.95) or E. Arthur Brown. Even if you don't yet have a printer interface for your 2068, this might just be what will cause you to take the plunge--one interface that can work with both computers. The only exception are those interfaces which plug into the cartridge port of the TS2068, since the TS1000 family has no such port. The UPD software supports COPY, LPRINT, and LLIST and allows the 512 byte program to be relocated anywhere in memory to make it compatible with most software.

Hopefully, this article will encourage more users to move up to the advantages of a full-size printer using standard bond paper.

Fred Nachbaur, C-12, Mtn. Station Group Box, Nelson, BC V1L 2J3 Canada.

Oxford Data, 99 Cabot Street, Needham, MA 02194.

Aerco, Box 18093, Austin, TX 78760.

Sunset Electronics, 2254 Taraval Street, San Francisco, CA 94116.

E. Arthur Brown Co., 3404 Pawnee Dr., Alexandria, MN 56308.

Byte-Back Co., Rt. 3, Box 147 Brodie Rd., Leeville, SC 29070.

-- Richard Cravy

Reprinted from S.U.M. May/86

Tape Makes a Difference

Since my years with the ZX81 and some time with the TS2068, I have fought the idea of adding another peripheral such as a Winky Board or any other type of amplifier and/or filter. I guess I'm fussy but I hate clutter in my computer area. So I've endured lost data, blaming it on the cassette recorder. In fact, I ended up by buying three recorders. Eventually, I went back to the first one, a Sony TCM-121, and had to run it "wide open" to get a good load on various brands of tape. A small, mostly defunct user group I once led had a "group buy" of cassettes once and we placed it with an outfit in Des Plaines, Illinois. In bulk, their prices per tape were the best we'd seen. The tape we'd selected out of the six offered still had me running at full volume. (This rates a "10" on my recorder since the volume control is marked from 1 - 10.)

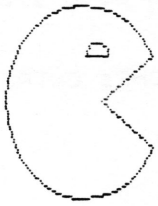
Thinking of the wide selection they had, I called Polyline Corp., the distributor of the tape we'd gotten on the group buy. When I asked the sales rep about comparisons between four types of tape, she sent a sample of each for me to try.

A test was run in this manner: using the Tasword II word processor program, I wrote a short article and SAVEd it to each cassette, one after the other. Next, I cleared the text from memory, set the volume control arbitrarily at "7" and was unsuccessful in LOADing the text from a BASF LHD cassette. Undaunted, I reset it at "8" and got a good LOAD. This means that I only needed 80% of the volume compared to any previous LOAD! Well, if the BASF was that good, what would the Magnetite 12 do for me? Since the text was already SAVEd, I set the volume control to "7" once again, cleared the text, and LOADed. It worked. Try "6". It worked, too! And with the Ampex 615/616 and Agfa 611/811 tapes could LOAD safely at "5" -- 50% of the volume required before the test!

No $12 amplifier, no $20 Winky Board, nothing more than more sensitive tape. Not only that, but the Agfa 615/616 C-10 tape cost only 34.9 cents per cassette when bought in a lot of 100, even less in greater quantities.

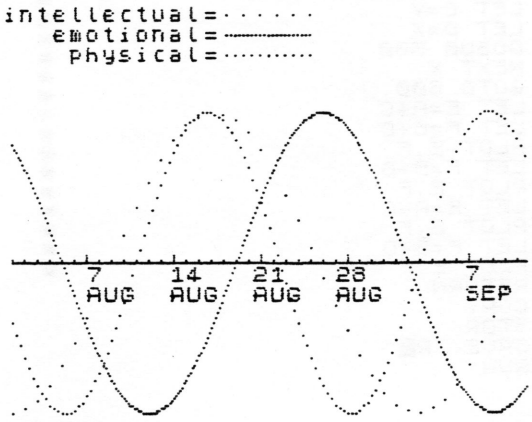
This is an unsolicited testimonial, not an advertisement. User groups or individuals who would like to get in on a good thing should call Polyline Corporation at 312/298-5300 or 312/297-0955 and ask for a free catalog #85P1. The rest is up to you.

-- John L. Donaldson



Pac - Man

```
 5 PRINT AT 20,10;"Pac - Man"
10 PLOT 127,87
20 DRAW 25,18
30 DRAW 0,-36,5.3
40 DRAW -25,18
50 PLOT 120,105
60 DRAW 10,0,-PI
70 DRAW -10,0
```




```
  1 REM ROUND TUIT
        BY KEN ABRAMSON

  5 PRINT "FIRST NAME?"
 10 INPUT N$
 15 CLS
 20 IF N$="" THEN GOTO 30
 25 PRINT AT 2,11;N$+"S"
 30 PRINT AT 3,11;"ROUND TUIT";
TAB 11;"
 40 PRINT TAB 9;"THIS RARE, BUT
";TAB 8;"MOMENTOUS DEVICE";TAB 8
;"WILL ENHANCE THE";TAB 7;"COMPE
TENCY OF ITS";TAB 6;"OWNER."
 50 PRINT AT 9,14;"IF YOU HAVE"
;TAB 6;"EVER SAID, ""I DIDNT";TA
B 7;"GET A ROUND TUIT,"""
 60 PRINT TAB 8;"THIS ROUND TUI
T";TAB 7;"SHOULD HELP YOU TO"
 70 PRINT TAB 7;"ACCOMPLISH ALL
 OF";TAB 8;"YOUR OBJECTIVES."
 80 PRINT TAB 9;"(NOT TO BE";TA
B 9;"CONFUSED WITH"
 90 PRINT TAB 11;"A SQUARE";TAB
 13;"TUIT)"
100 LET A=31
110 LET B=22
120 LET R=20
130 FOR X=0 TO R/SQR 2
140 LET Y=SQR (R*R-X*X)
150 LET C=X
160 LET D=Y
170 GOSUB 500
180 LET C=Y
190 LET D=X
200 GOSUB 500
210 NEXT X
220 GOTO 600
500 LET E=A+C
510 LET F=B+D
520 PLOT E,F
530 LET F=B-D
540 PLOT E,F
550 LET E=A-C
560 PLOT E,F
570 LET F=B+D
580 PLOT E,F
590 RETURN
600 COPY
610 STOP
620 SAVE "R■"
630 RUN
```

Reprinted from S.U.M. May/86

Banners on the TS-2040

Here is a program that will allow you to input a message and have it print out the message as a banner on the 2040 printer.

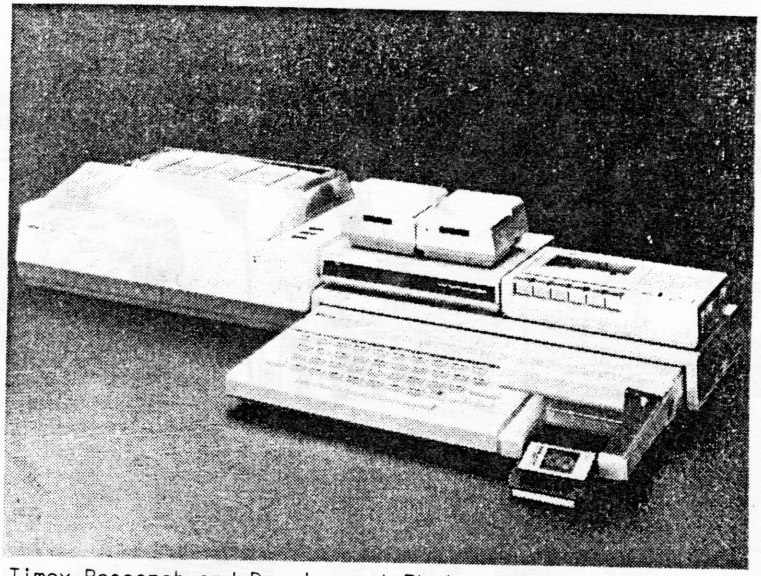
The letters are generated one at a time by PEEKing at the letter to be generated in the ROM, making it 8 times normal size and turning it on it's side and then COPYing it to the printer.

The program is much faster in FAST mode, but you can't see the letter forming. ~~By changing line 120, you can change the character that is actually used in printing the large one~~.

Enter the program as listed and use GOTO 280 to SAVE it so that it will self start next time it's LOADed.

```
 10 PRINT ,,"  INPUT MESSAGE"
 20 INPUT M$
 30 LET LEN=LEN M$
 50 FOR L=1 TO LEN
 55 LET CH=CODE M$(L)
 60 LET R=7680+(CH*8)
 63 LET A=1
 67 LET B=1
 70 FOR R=R+7 TO R STEP (-.25)
 80 LET RC=PEEK R
 90 FOR H=1 TO 7
100 LET D=RC
110 FOR G=1 TO 3
120 IF G=2 OR 3 THEN LET RC=D
130 LET CNTR=0
140 IF RC<128 THEN GOTO 170
150 LET CNTR=128
160 LET RC=RC-128
170 LET RC=RC*2
180 PRINT AT A,B;CHR$ CNTR;
190 LET A=A+1
200 NEXT G
210 NEXT H
220 LET A=1
230 LET B=B+1
240 NEXT R
250 COPY
260 NEXT L
270 STOP
280 SAVE "BANNER■"
```

-- Joe Williamson



Timex Research and Development Photo shows the never released Bus Expansion Unit (BEU) "piggy-backed" just behind the TS2068. The TS2020 Tape Recorder, TS2050 Modem and the Sinclair Microdrives are sitting on top.

++

Reprinted from 7/86 "SMUG BYTES"
Sinclair Milwaukee Users Group

Brain Tickler

COMPUTER EDIFICATION

8-BIT MACHINE - a computer selling for four quarters.

6502 - The year you will finally pay off your computer.

68000 - The year your spouse will forgive you for buying a computer.

BAR CODE READER - Electronic device used to find taverns.

BATCH PROCESSING - Making lots of cookies at once.

BAUD RATE - The number of attractive and skimpily clad women/men passing by you on the beach.

BREADBOARD - The only kind of board you can afford after buying a computer.

BUBBLE SORT - Your spouse's term for your friends.

BUFFER - Programmer who works in the nude.

U.S. Journal Sep./Oct. 1981.

SHOE

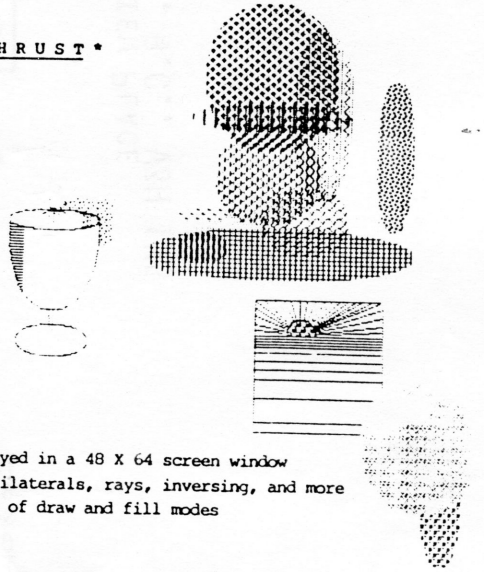
SHOE

SHOE

WEYMIL CORPORATION

...makes a serious commitment to the Timex user in the development of high-quality, innovative, and user-friendly software, complete with layman-oriented documentation, and all at affordable prices. We are proud to offer you:

* THRUST *



Finally, real graphics power for your TS 1000! THRUST, the last word in cursor-controlled hi-res graphics for screen or printer output, is a software package composed of SincArtist HR and SincArtist 1.3. Examine this sample for an idea of the powerful versitility of THRUST.

SINCARTIST 1.3 - The original! Fantastic hi-res graphics delivered to the 2040 printer. SincArtist 1.3 boasts excellent user-group reviews and is simply the best non-hardware system available. Note these features:

- 192 X 256 high-resolution file displayed in a 48 X 64 screen window
- Circles, triangles, rectangles, quadrilaterals, rays, inversing, and more
- 40 redefinable patterns and a variety of draw and fill modes
- Cursor or joystick control
- No system modifications required

SINCARTIST HR - The last word in cursor-controlled high-resolution screen graphics. Copy artwork to the 2040 printer and save to tape. SincArtist HR requires a TS 1000 with a socketed 2K RAM, less than $10.00 in parts, and a few minutes with a soldering iron. Super user-friendly documentation and instructions included. All modifications are fully transparent to other peripherals. HUNTER BOARD OWNERS: All you need is the FREE hardware upgrade that we provide!!!!!

THRUST includes SincArtist HR and Sinc-Artist 1.3 (these programs are not sold separately). The Ultimate Hi-Res Tape is available exclusively from Weymil Corporation for only $20.

* MINI XMOD *

MINI XMOD - Allows your Westridge or Byte-Back modem to up and download Timex programs to any Xmodem protocol BBS.

- Fully documented with easy-to-follow instructions for the layman
- 16K and 64K versions included
- Ideal for storage in Hunter Board
- Produced on high-quality casette for the ZX 81, TS 1000, and TS 1500

MINI XMOD is available from Weymil Corporation for only $20. Please specify Westridge or Byte-Back version.

WEYMIL CORPORATION
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98227-5904

(Write for a free catalogue of other TS 2068 and TS 1000 products)

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PORT MOODY, B.C., V3H 1N5

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PRES.--KEN ABRAMSON
V/PRES.-- ?
TREAS. & EDITOR--ROD HUMPHREYS

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